Final Report to

U.S. ARMY CORPS OF ENGINEERS

INVENTORY OF FORMERLY USED DEFENSE SITES: SITE 3 NO. H09HI0466 OFFSHORE WATERS, HONOLULU, HAWAII

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1.0 INTRODUCTION

Environmental surveys for the selection of new dredge spoil disposal sites undertaken in 1975-1977 in the offshore waters just south of Honolulu and Pearl Harbor, Hawaii, led to the inadvertent collection of significant quantities of unexploded military ordnance. Several researchers and crew members were seriously injured by leaking canisters of toxic liquids believed to be mustard gas and some 1500 pounds of unexploded ordnance were recovered in bottom trawls. In the interest of determining if additional ordnance was present in the offshore waters, and the responsibility and possible need for cleanup action, an inventory of the sea floor was initiated using side-scan sonar and video photography of the two sites where unexploded ordnance had been recovered.

1.1 Project Description

Background. The nearshore ocean waters of the south shore of Oahu have long been used as disposal areas for dredge spoil and various types of wastes, both military and civilian. Prior to 1972, disposal of dredged material was apparently confined to the nearshore coastal waters out to the "Southern Limit of the Dumping Ground", a straight line connecting Barbers Point and Diamond Head and shown on the older, 1975, U.S.G.S. Chart number 19364. In more recent years, the depth of water for disposal has gradually been increased as technology has provided means for accessing deeper water and the disposal sites from previous generations have come within man's reach.

The tradition of disposal of dredged materials in the relatively "nearshore" offshore waters, was likely a factor in the dumping of military ordnance in these areas too. Furthermore, it must be recognized that during World War II, the consideration of possible "environmental" repercussions associated with disposal of military ordnance was not a priority.

Since 1972, the United States Army Corps of Engineers Pacific Ocean Division (POD) has maintained various dredge spoil disposal sites within the general area of Mamala Bay, Oahu, some 3 to 6 miles south of the Honolulu International Airport. New dump sites were proposed in 1975 in the vicinity of the other sites. Research studies of these proposed new sites were undertaken to determine the environmental characteristics of the sites and to evaluate whether the disposal of dredged material would have a significant effect on the physical, chemical, or biological characteristics of the sites. It was during these studies that some 1500 pounds of military ordnance were inadvertently recovered in several of the dredge hauls. Canisters of toxic liquids, believed to be mustard gas, ruptured on retrieval and caused serious injuries to members of the scientific team and ship's crew. The presence of military ordnance suggested that these two sites may qualify as Formerly Used Defense Sites (FUDS) under the Defense Environmental Restoration Program (DERP).

The University of Hawaii Environmental Center was contracted by POD to conduct site investigations using remote scanning equipment and to compile an inventory of information available on the two sites where this ordnance was reported. The investigation includes the preparation of a description of each site's existing environment, interviews with persons knowledgeable about the military munitions disposal activities, research of real estate records as to ownership and their use of the sites, and a discussion of the feasibility of environmental restoration, if required. The primary goal of the project was to determine whether any ordnance or explosive waste materials generated by the Department of Defense require any cleanup action.

1.2 Site Description

Study Site. The study area was located in the offshore waters some 3 miles south of the Honolulu International Airport Reef Runway and Pearl Harbor Naval Base, Oahu, Hawaii (fig. 1). The designated study site, 3 (H09HI0466) was a circle of 1000 yard radius centered at 21° 14.8' N by 157° 55.84' W. (fig. 2). The water depth ranges from 440 meters at the northern limit of Site 3 to 475 meters at the southern limit.

Two dredged material disposal sites are currently located in the vicinity of Site 3 (fig. 2), the South Oahu and Honolulu Harbor sites. In addition, an arch-shaped area closer to the mouth of Pearl Harbor was used for disposal for a brief time in 1977 as part of a study of the environmental effects of dredge spoil disposal (Chave and Miller, 1978). Some 700,000 cubic yards of spoil were disposed in the south eastern corner of that study site.

These sites have been used since 1977 as disposal sites for dredge spoil mainly originating from Pearl Harbor and Honolulu Harbor. According to records provided by the Operations Division of the Army Corps of Engineers, approximately 4 million cubic yards were dumped at the South Oahu site and 4.1 million cubic yards at the Honolulu Harbor site since 1976. Ocean dumping permits were not required until 1976 so records prior to that year are questionable. However, we did find a reference to some 4.2 million cubic yards of dredged material being dumped between 1959-1976 one nautical mile due south of buoy number 1 marking the Pearl Harbor entrance channel (Chave and Miller, 1978). Regardless of the absolute accuracy of the specific locations of disposal, it is apparent that large quantities of dredged materials have been disposed over the past 50 or more years in the waters just offshore of Honolulu and Pearl Harbors. This use of the offshore environment is important in considering remedial actions, if any, for explosive wastes that may be present in this area.

Physical Oceanographic Conditions. The tides in the study area are classified as mixed diurnal/semi-diurnal and are characterized by approximately 2 tidal cycles per day, with one high tide typically higher than the other. The currents generated by the tides are believed to be supplemented by internal waves at the thermocline. Maximum currents of 0.8 knots have been measured at the bottom (356m) near the study area (Chave and Miller, 1977).

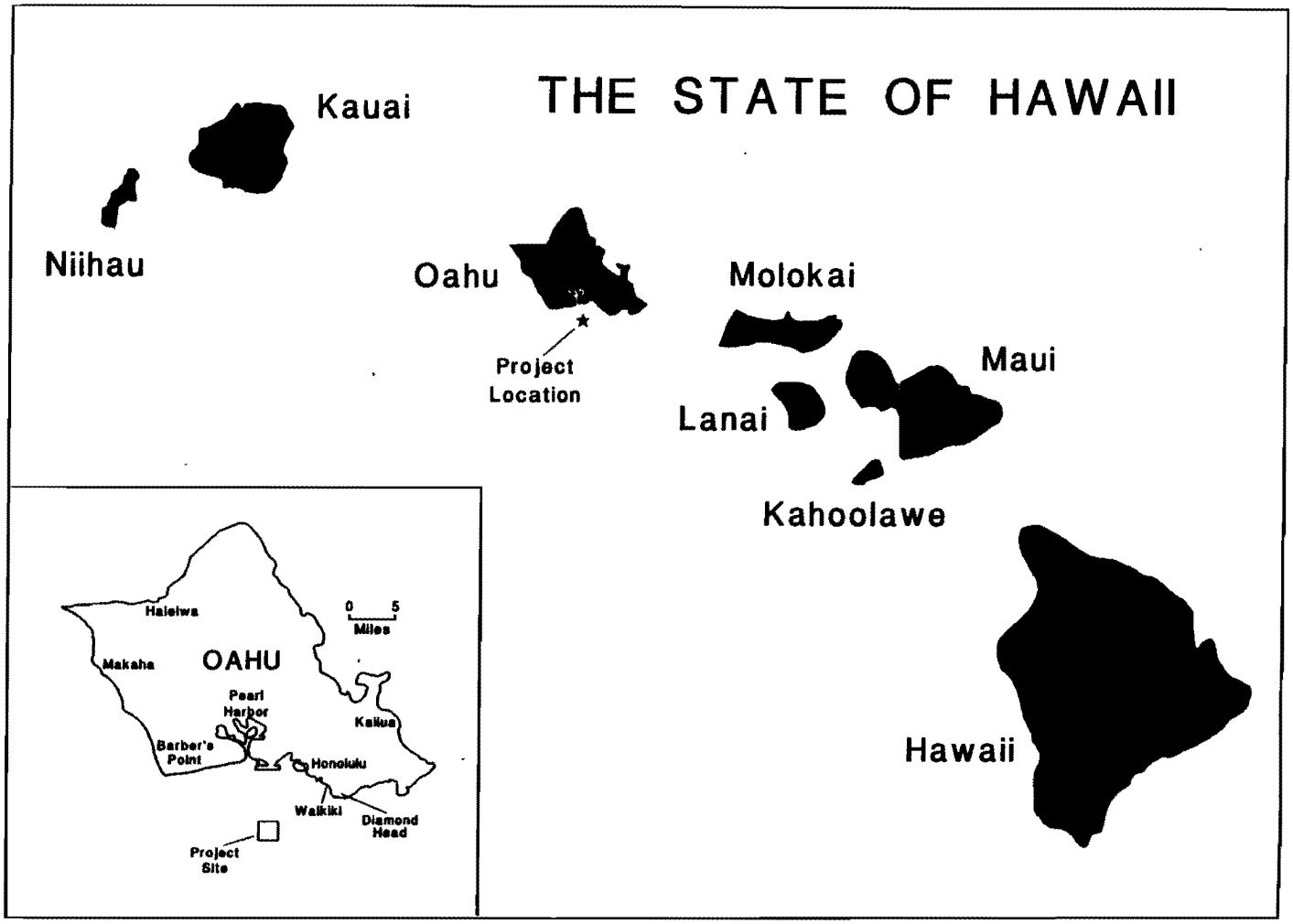

Figure 1. Location of FUDS Study Site 3 (H09HI0466).

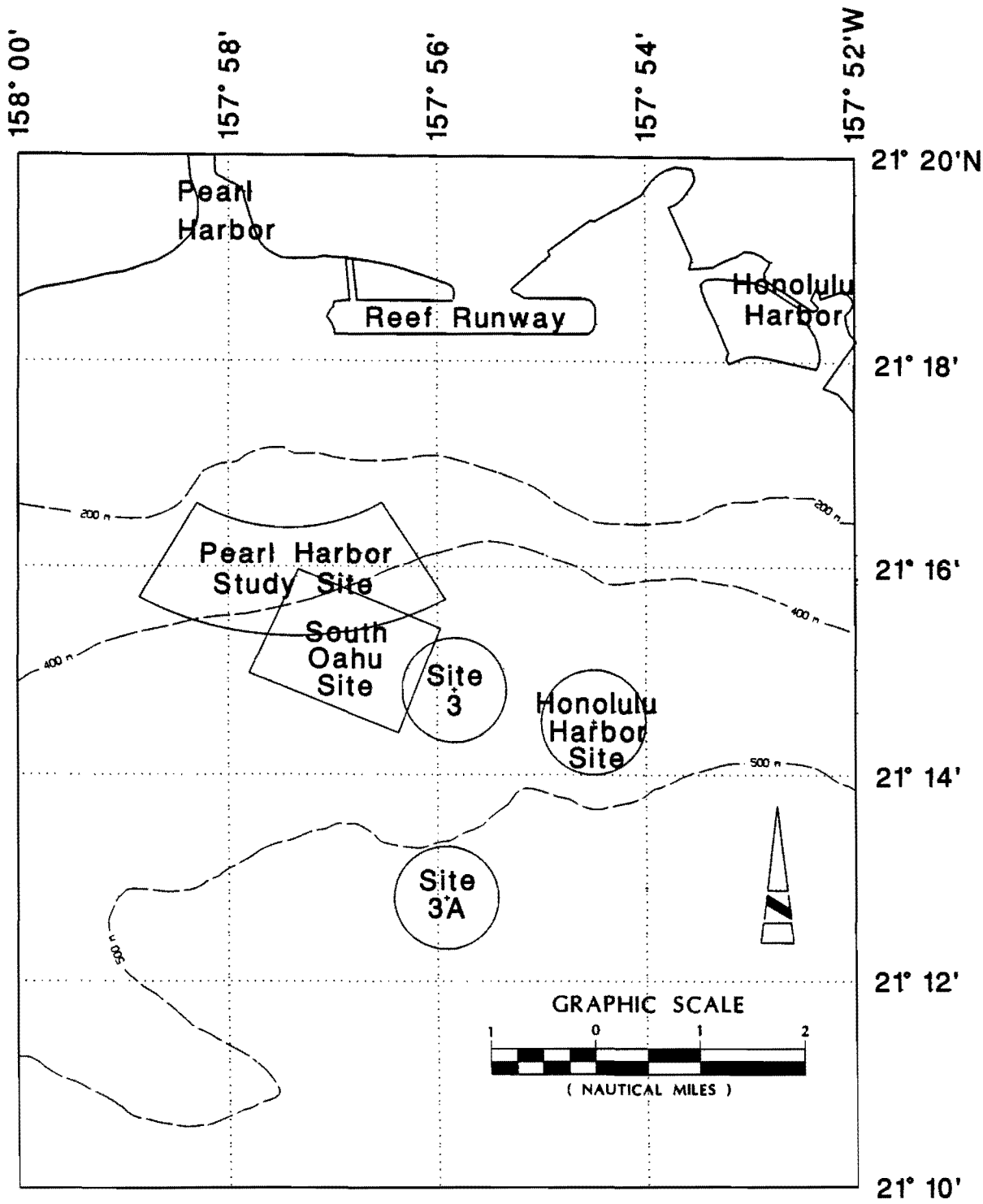

Figure 2. Location of FUDS Study Site 3 (H09HI0466) and its relation to FUDS Site 3A (H09HI0467) and dredge spoil disposal sites in Mamala Bay, Honolulu, Hawaii.

2.0 METHODS

The inventory of the site involved a review of the historical literature, data, records, and files relative to the presence of explosive ordnance in the marine environment as well as a major effort to contact individuals and organizations with pertinent information. Field expeditions were then undertaken using state-of-the-art high resolution side-scan sonar systems and a new, deep water, video camera system to provide the required documentation to confirm the presence and nature of the explosive ordnance in the coastal waters off Honolulu and Pearl Harbors.

2.1 Historical Background

Literature Search. An extensive literature search for background material on the disposal of military ordnance was conducted to locate any references to the disposal of ordnance in Mamala Bay or off the southern coast of Oahu. This search included use of the University of Hawaii, Manoa, computer search facilities, examination of records in the Hawaiiana collection at U.H. Manoa, Hamilton and Sinclair Libraries, the State of Hawaii Public Library on Oahu, and perhaps most importantly the 1929 to 1984 bound indexes and the 1985-1994 computer indexes of the two Honolulu Newspapers, the Honolulu Star Bulletin and the Honolulu Advertiser. Our searches returned numerous articles regarding the discovery of ordnance in coastal waters and specific citations of unexploded ordnance that had been discovered in areas of Makua Beach, Ala Moana Beach Park, Waialua, and Rabbit Island.

Hawaii Undersea Research Laboratory (HURL) Videos. The Hawaii Undersea Research Laboratory of the University of Hawaii maintains and operates two submersibles that have in the past been used near the Mamala Bay disposal sites. The *Makali'i* was used from 1981 through 1986 and made 13 dives as part of a dredge spoil study project. Six dives were made with the *Pisces V* of which one was made in approximately 1000 feet of water north of the study area in 1992.

Voice transcripts and transcribed video logs from all dives in the general vicinity of the study site were reviewed for reference to ordnance. Videos of the dives where ordnance were sighted were viewed and still images were made of all ordnance identified. The sound tracks of the video tapes made by the submersible crew frequently discussed seeing ordnance that was not necessarily filmed by their cameras. Hence, examples of references to ordnance in the voice transcripts are submitted with the still images as additional data.

2.2 Field Work

Research Vessels. The University of Hawaii Marine Center's R/V Kila was the primary vessel for all research cruises during this contract. The R/V Kila is a 105 foot, diesel powered vessel. The size of the ship's crew ranged from 3 to 6 with a 5 to 10 person scientific party. Additional ship time was made available at no charge, aboard the University research ship Moana Wave, courtesy of Dr. Roy Wilkens, during preliminary test runs of his video camera system.

A navigation program titled Maptech was available for the sonar cruises to assist in navigating, since following particular tracklines was essential to the subsequent data analyses and development of computer generated mosaics of the bottom.

The initial field research plan called for complete side-scan sonar surveys of the study site so as to locate suspected ordnance that could then be photographed with the video system on a subsequent cruise. Because the sonar system provides a much broader beam width for each transect than is possible with the video camera, we expected to maximize the efficiency of the available ship time by using the sonar images to locate potential ordnance and use the video for confirmation and documentation.

Side Scan Sonar. Site 3 was of sufficient size and depth that remote methods were required to inventory the site for possible ordnance. Topographical images of the ocean floor were acquired using an EG&G DF-1000 Digital Side Scan Sonar System. The system consisted of a DF-1000 digital towfish, Kevlar reinforced co-axial cable, depressor weight, digital control unit, and Sun computer data logging system. The system was provided and operated by Dr. Charles Morgan of the University of Hawaii's Marine Minerals Research Center.

The towfish and depressor weight were deployed and cable payed out until the towfish reached an altitude of approximately 40 meters above the bottom. The altitude was continuously monitored and adjusted to maintain proper position above the bottom. The towfish emits a sonar beam of 50° vertical width from each side of the unit. The area of coverage increases with altitude, but resolution decreases, hence every effort was made to keep the towfish as close to the bottom (i.e., 40 m) as safety for the equipment would permit. The frequency of the beam is user-selectable as either 100 kHz or 400 kHz. The time and strength of the return signal signifies the distance from the unit and characteristics of the reflector: strong signals are emitted from rock or metal, weak signals correspond to poor reflectors, such as sand. Most of our sampling was done at the 400 kHz frequency to maximize the possibility of imaging small scale (ordnance sized) materials.

The towfish unit digitizes the data and sends it to the computer system, where it is displayed in real-time, waterfall format and continuously saved to the tape drive. The data from various passes through the study areas were subsequently processed and combined into mosaic form to show the features of the entire area.

Fiber Optic Communication Undersea System (FOCUS). To inventory the individual pieces of ordnance in the study site it was necessary to obtain visual images of sufficient clarity and resolution to permit explosives ordnance specialists to accurately identify the types of ordnance discovered. To this end we used a new "Fiber Optic Communication Undersea System", **FOCUS**. FOCUS is a real-time deep-sea video system designed by Dr. Roy Wilkens and Mr. Patrick Jonke of the Hawaii Institute of Geophysics of the University of Hawaii, Manoa. The system takes advantage of the unique characteristics of fiber optic telemetry that permits the use of a relatively small, lightweight cable and wide bandwidth attributable to fiber optics. This allows the system to be used at great depths without compromising the quality of the return signal. The system has been funded by the National Science Foundation and the University since 1989.

Power is provided by the support vessel and passed through the copper conductor portion of the fiber optic cable to the camera vehicle. The video signal from the camera is transported up the cable to a Video Cassette Recorder (VCR) that records the real-time image. Two 500 Watt incandescent lights illuminate the field of view.

The system is capable of viewing the sea floor from an altitude of approximately 10 m, but in practice, the camera vehicle is typically flown at an altitude of 1 to 5 m. The system is rugged enough to survive occasional collisions with the bottom without sustaining damage, but bottom entanglement is always a risk. Early in the camera inventory work a series of unfortunate actions occurred that included an apparent electronic problem that led to reduced picture quality which in turn led to bottom impact, cable failure, and the loss of the camera.

A replacement system was constructed and used for the final photographic work for the inventory. The new system includes a forward looking camera and two additional lights.

3.0 RESULTS/FINDINGS

3.1 Historical Background

Literature Search. An intensive effort was undertaken to locate old records, journals, reports, and newspaper articles relating to ordnance disposal in the marine environment off of Honolulu and Pearl Harbors. A complete listing of the libraries, documents, and subject titles searched as well as a summary of the findings of this effort is presented in the DERP-FUDS Inventory Project Report: Sources of Information. With the exception of newspaper articles, very little definitive information was obtained from most of these sources. Newspaper articles were somewhat more specific and provided numerous accounts of incidents of ordnance discovery in nearshore waters. Specific information on the ocean disposal of ordnance or use of the site by the military was unavailable.

Interviews. Interviews were held with various individuals and military commands in an attempt to uncover historical evidence of ordnance disposal in Mamala Bay. Individuals or specific military commands to interview were selected on the basis of referrals from a superior command to the applicable subordinate command, or by personal knowledge of individuals and the Hawaii naval force structure by the research team.

Historical research proved to be frustrated by a lack of data, probably caused by the long time span ($\sim$50 years) involved. It was found that newspapers provided useful accounts of ordnance discoveries by the public, or of major incidents, but little record of ordnance inventories seemed to be available. The nature of "disposal" may have contributed to the paucity of information since objects "disposed" may not have been deemed worthy of record keeping. A listing of the references examined and interviews completed is provided in the DERP-FUDS Inventory Project Report: Sources of Information.

3.2 Field Work

Side Scan Sonar. Side scan sonar cruises were made aboard the University of Hawaii's R/V Kila on November 16, 1994, and January 24, 1995. Cruise tracks are shown in Figure 3. The data were analyzed by the Marine Minerals Technology Center and output into a mosaic format showing the entire study area (Appendix A of the DERP Report). The mosaic suggests that the northern portion of Site 3 is characterized by large, irregular reflectors, but the resolution of the side scan sonar instrument was insufficient to characterize the bottom sediments or to identify any small scale reflectors as would be expected for ordnance.

Fiber Optic Communication Undersea System (FOCUS). FOCUS cruises aboard the University of Hawaii's R/V Moana Wave and R/V Kila have provided some 12.75 miles of video coverage in the general vicinity of the study site (figs. 4, 5, and 6). Unfortunately, due to a series of equipment failures, and/or rough seas and strong current conditions, the intended systematic transect cruises with the FOCUS system through the central portions of the study site were only marginally successful. Each set of cruises began with general testing of the system in shallow water to assure proper instrument functions and to ascertain current drift. Subsequent deployment was in the vicinity of the specific study site, however, off-course drift frequently became a significant problem due to wind, sea, and current conditions in Mamala Bay.

On the more positive side, a total of 24 definite ordnance items in the immediate vicinity of the designated study site were identified by Donaldson Enterprises, Inc. (Table 1 and fig. 7; Appendix B of the DERP Report). It was apparent that considerable material is present north of Site 3. The side-scan sonar data showed many strong returns in that area and the region was surveyed with the video camera in an attempt to provide "ground truth" for the side-scan sonar data. However, the only "objects" found in the video footage were precipitous coral blocks or basaltic flows with vertical relief of at least 30 meters in some cases. There was no indication of man made objects providing the hard return signals recorded by the side-scan system and all objects that could have produced the returns recorded appeared to be only natural features of irregular, bottom relief.

Hawaii Undersea Research Laboratory (HURL) Videos and Transcripts. Dive logs, voice transcripts, and video logs from 13 *Makali'i* dives and 6 *Pisces V* dives were examined. Two of the dives (*Makali'i* 82-87 and *Pisces V* P5-200) provided 9 hours of video including many ordnance observations. Still images from the video and voice transcripts are included in Appendix B of the DERP Report. Donaldson Enterprises, Inc., provided identification of the ordnance.

Donaldson Enterprises Incorporated Descriptions. A list and video images of the 24 individual ordnance items identified in either the videos taken with the FOCUS system or on the HURL dives are shown in Table 1; and in Appendix B (Plates 1-24) of the DERP Report.

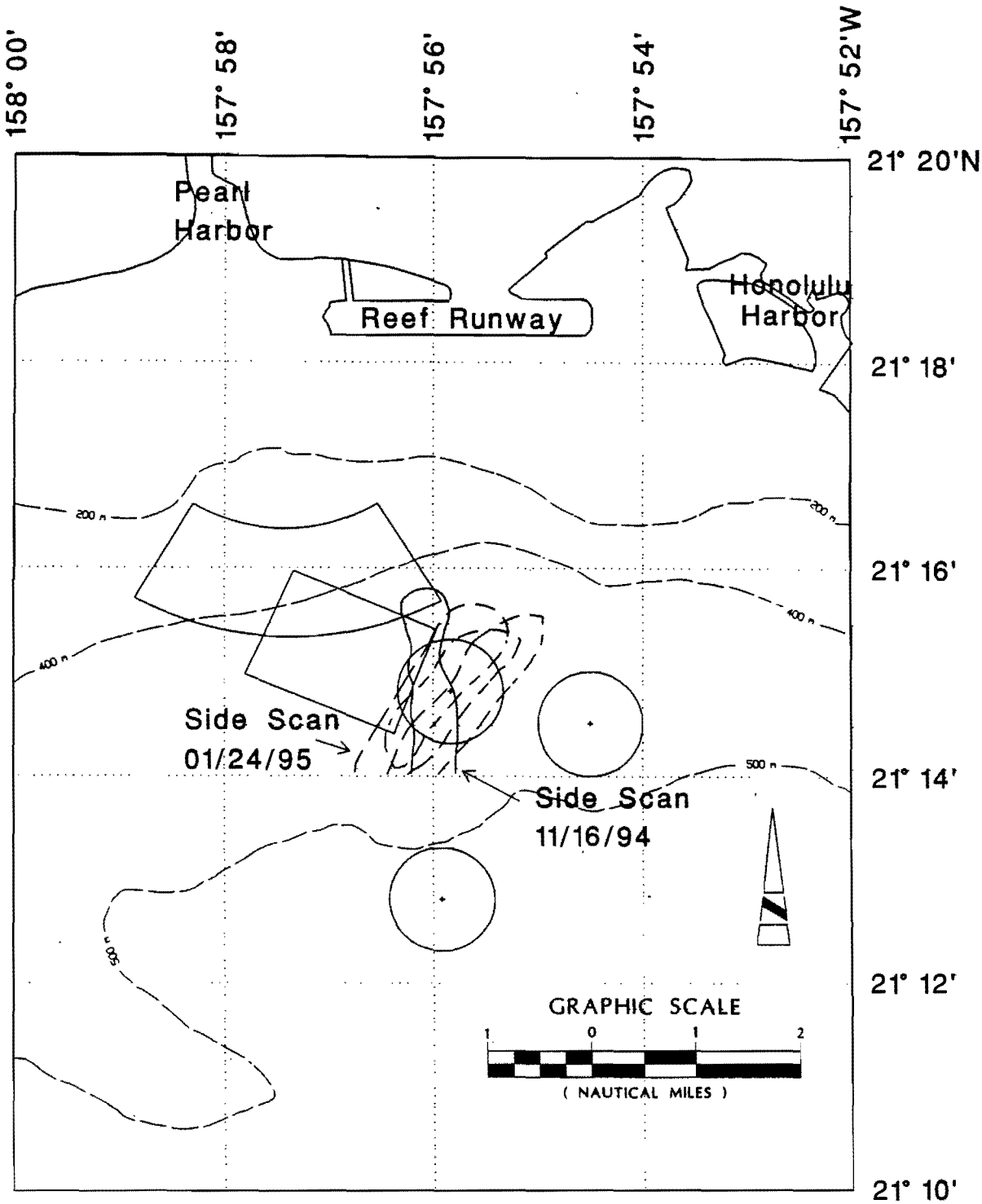

Figure 3. Side scan sonar cruise locations.

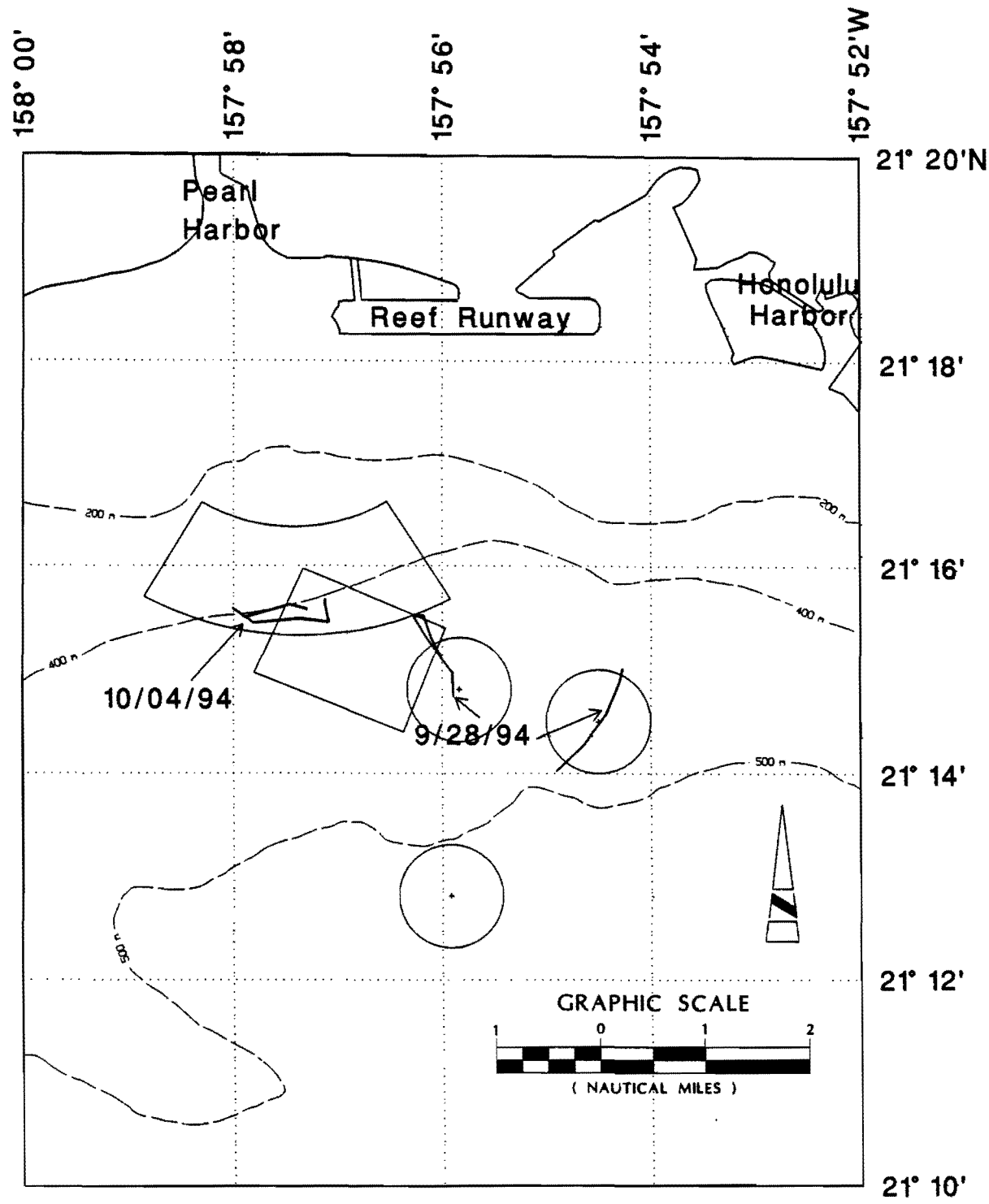

Figure 4. Location of video transects made on September 28, 1994 and October 4, 1994.

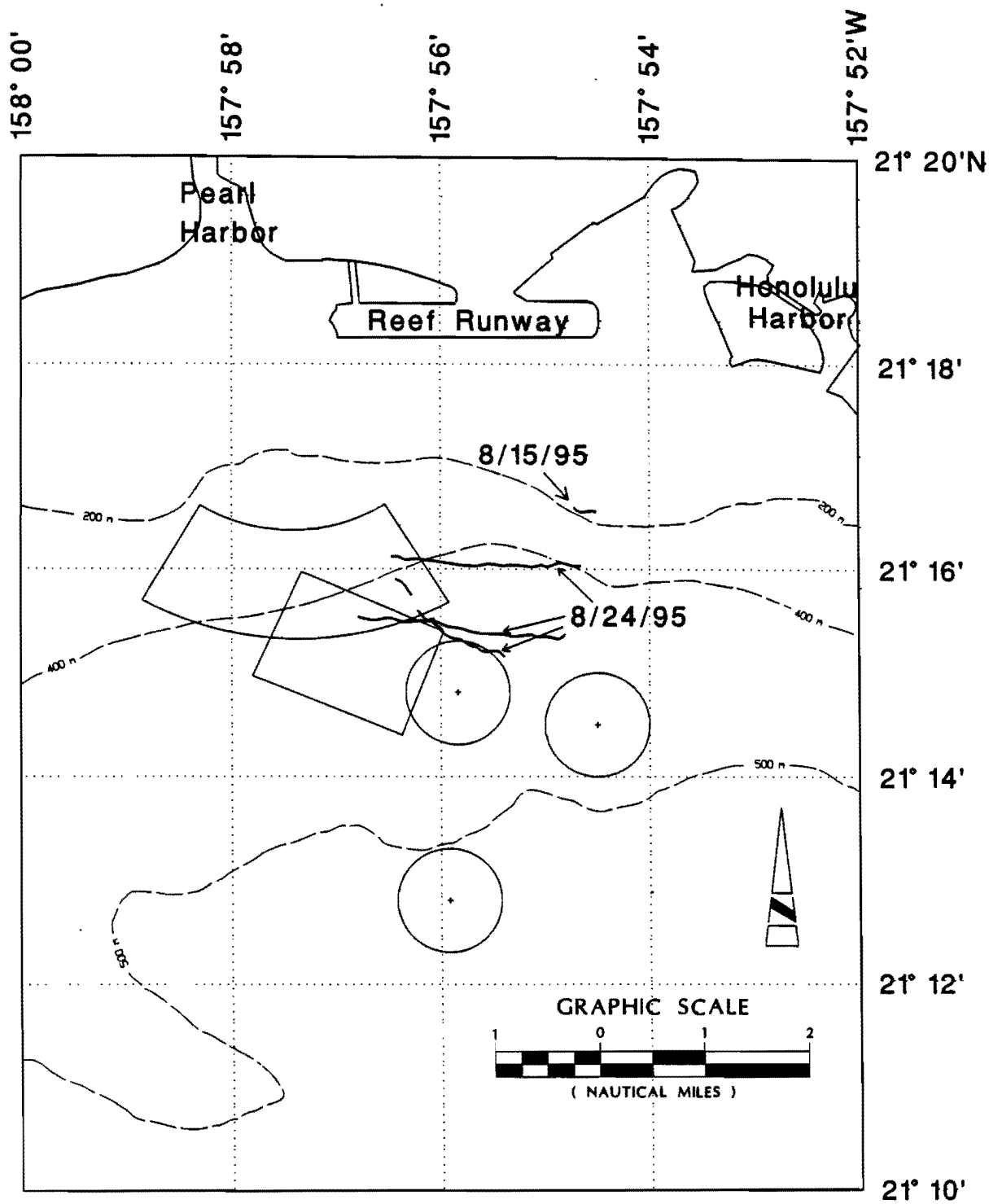

Figure 5. Location of video transects made on August 15 and 24, 1995.

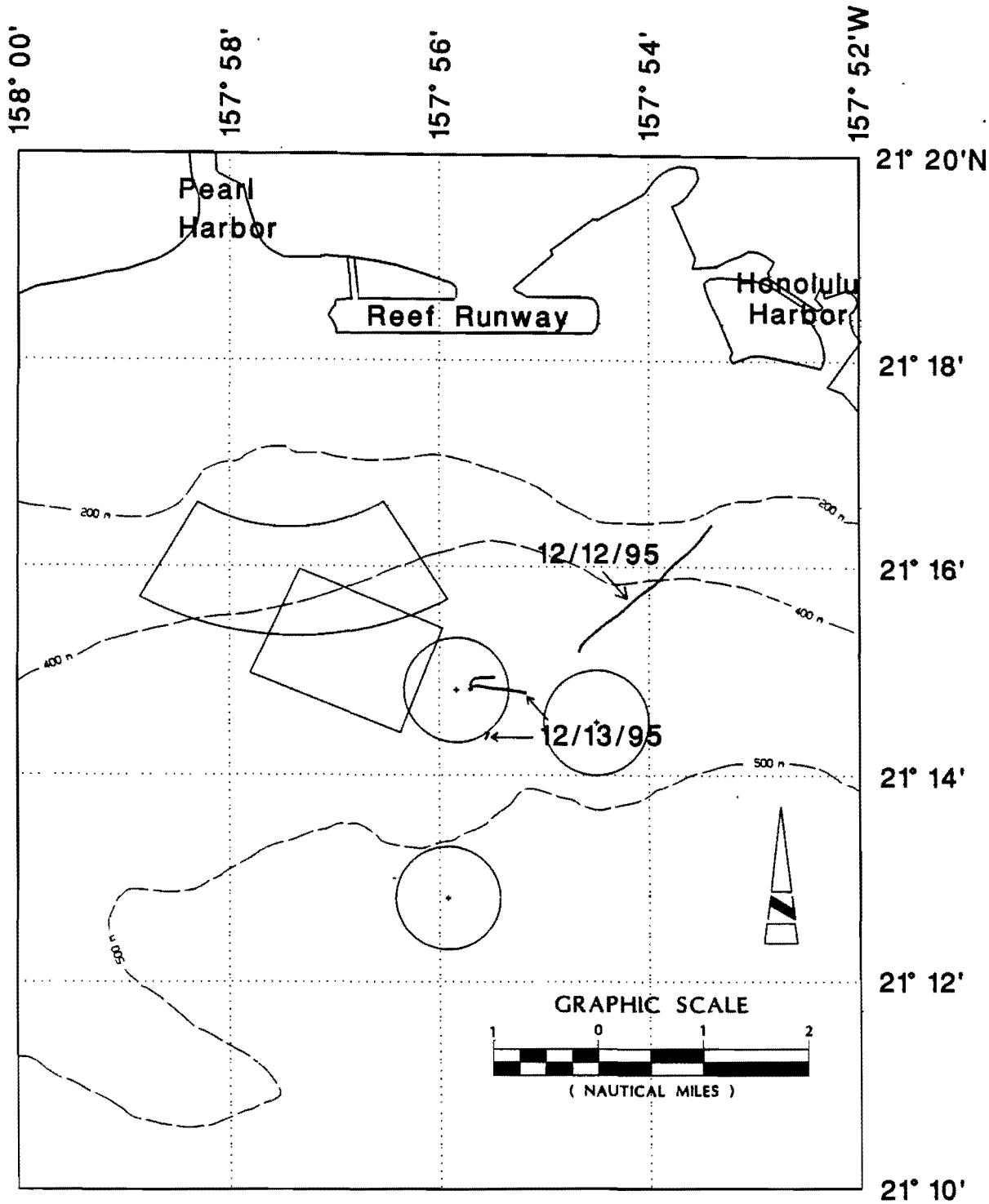

Figure 6. Location of video transects made on December 12 and 13, 1995.

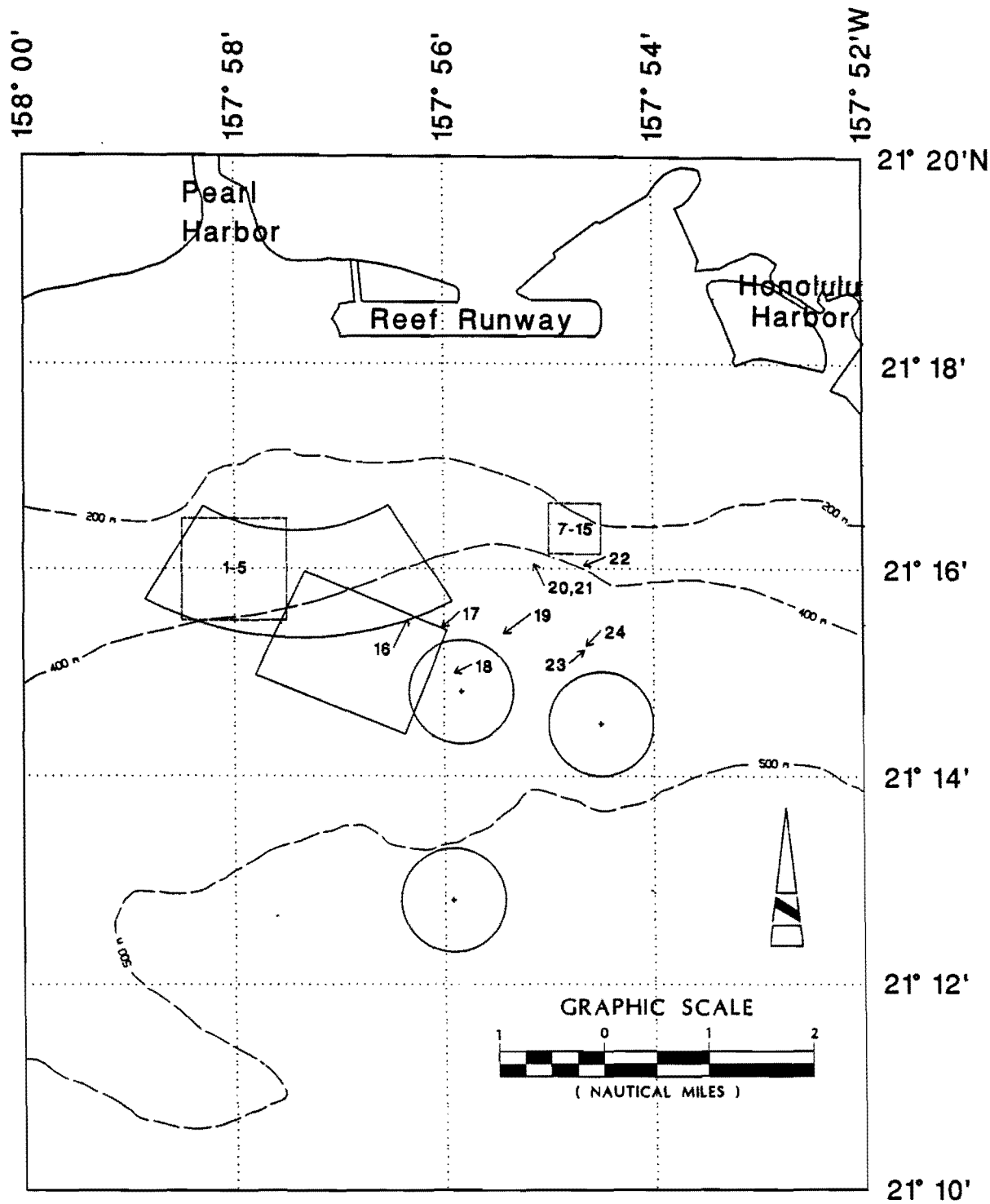

Figure 7. Location of ordnance and explosive wastes as recorded on videotape. Numbers correspond to ordnance identifications listed in Table 1 as provided by Donaldson Enterprises, Explosive Ordnance Disposal Specialists.

FUDS/FOCUS Video/Ordnance Locations				
Site 3				
Item No.	Description	Longitude	Latitude	Survey
		(157 deg)	(21 deg)	
1	Depth Charge, Torpex.	58	16	P5-200
2	Naval Projectile, 8" to 16".	58	16	P5-200
3	Projectile, Possible 40mm.	58	16	P5-200
4	Depth Charge, Amatol Filler.	58	16	P5-200
5	Projectile, 8" to 16", Explosive "D" Filler.	58	16	P5-200
6	Naval Artillery Shell 8" to 16", Explosive "D" Filler.	58	16	P5-200
7	Naval Artillery Shell 3" to 16", Explosive "D" Filler.	54.7	16.4	82-87
8	Naval Artillery Shell, Explosive "D" Filler.	54.7	16.4	82-87
9	Naval Artillery Shell, Explosive "D" Filler.	54.7	16.4	82-87
10	MK 50 Mech Time Fuse, Black Powder Filler.	54.7	16.4	82-87
11	Depth Charge, Torpex.	54.7	16.4	82-87
12	Mine.	54.7	16.4	82-87
13	Projectile, 8" to 16".	54.7	16.4	82-87
14	Naval Artillery Shell 8" to 16", Explosive "D" Filler.	54.7	16.4	82-87
15	MK 50 Mech Time Fuse, Black Powder Filler.	54.7	16.4	82-87
16	Projectile Shape w/Deposits of Residue in General Area.	56.34	15.51	8/24/95
17	Projectile.	56.02	15.43	8/24/95
18	Cylinder with Fin Configuration.	55.91	14.99	9/28/94
19	Flat Circular Plate or Base of Projectile.	55.43	15.37	8/24/95
20	Projectile.	55.14	16.05	8/24/95
21	Bomb (100-250 lb.). Configuration Suggests Chemical.	56.33	16.09	8/24/95
22	Small Arms Ammunition.	54.66	16.03	8/24/95
23	3" Cartridge Case and Round.	54.66	15.21	12/12/95
24	Projectile, Possibly 8".	54.64	15.25	12/12/95

Table 1. Location and description of ordnance video taped during FOCUS transects and HURL surveys. Ordnance identified by Donaldson Enterprises.

4.0 RECOMMENDATIONS

The original intent of the work plan was to identify possible ordnance using high resolution side-scan sonar with subsequent video mapping to provide ground truth. The side-scan sonar data proved to be fruitless. Resolution, even after extensive efforts at computer image processing and enhancement, was insufficient to detect ordnance sized objects. On the more positive side, the video camera work, despite many small but operationally important delays and problems, provided excellent visual documentation of explosive wastes on the sea floor over a much wider area than had previously been suspected.

Given the knowledge that explosive wastes do occur in this deep water area, we must consider what further action, if any, should be taken. In our early discussions, we had initially thought that if explosive wastes were found in the study site, one remediation action that could be considered was burial with dredge spoil. Since the existing dredge spoil disposal sites are very close, we had thought that a modest relocation of the Honolulu and South Oahu disposal sites might be feasible. However, the video images clearly show that a substantial number of explosive materials are remaining at the surface, even in areas where millions of cubic yards of dredged spoil have been dumped in the past. Hence, we have concluded that bottom currents or even biological perturbation of the sediments are sufficient to keep at least a fair percentage of the bulky materials, rocks, munitions, bombs, etc. swept clean, perhaps in the same manner that manganese nodules are found lying on top of finer deposits on the sea floor.

Because we are unsure of the areal extent of the explosive ordnance as of this time, we are unable to make a definite recommendation as to remedial action. We recommend that additional systematic video transects be undertaken, with emphasis on the areas between 50 and 350 meters directly south of Pearl and Honolulu Harbors, to verify and map the extent of the ordnance. Following this mapping, we suggest that alternative remediation measures be examined, including the no-action alternative, to arrive at an environmentally as well as economically supportable restoration or management recommendation.

DERP - FUDS

Inventory Project Report

Offshore Waters, Honolulu, Hawaii
Island of Oahu, Hawaii
Site 3 No. H09HI0466
February 28, 1996

Prepared by
University of Hawaii
Environmental Center

For
U.S. Army Engineer District
Pacific Ocean Division
Fort Shafter, Hawaii

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for DERP-FUDS Inventory Project Report

SITE SURVEY SUMMARY SHEET
FOR
DERP - FUDS SITE 3 NO. H09HI0466
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
28 FEBRUARY 1996

SITE NAMES: This offshore site has been referred to as "Offshore Waters, Honolulu, Hawaii", the "region near the dredge spoil dump sites", or as "Corps of Engineers Site 3", due to a Corps of Engineers benthic survey conducted in 1977 (figures 1 and 2).

LOCATION: The site is a circle with a 1000 yard radius and central points at 21° 14.8' N. by 157° 55.84' W. The survey area extends approximately 3 to 4 miles south of the Honolulu Airport reef runway. Water depth varies from 440 to 475 meters.

SITE HISTORY: During a POD-sponsored benthic survey in 1977, research personnel recovered canisters of a liquid which caused severe chemical burns. In addition, research personnel recovered 1500 lbs of military ordnance including a live 300 lb depth charge. Individuals responsible for disposal are unknown but ordnance was all of military origin and responsibility.

There are published newspaper accounts of bazooka rockets and other ordnance washing ashore at Ala Moana Beach Park, approximately 4 miles from the surveyed area.

SITE SURVEYS: Side-scan sonar and videocamera surveys were conducted from two University of Hawaii research vessels: two trips on the **R/V Moana Wave** on Sep 28, 1994 and Oct 4, 1994 and nine trips on the **R/V Kila** on Nov 16, 1994; Jan 24, 1995; Feb 8, 1995; Mar 3, 1995; Aug 15, 1995; Aug 24, 1995; Sep 7, 1995; Dec 12, 1995; and Dec 13, 1995. Scientific personnel participating in the field work included: Jacquelin N. Miller, Hans-Jurgen Krock, Charles Morgan, Roy Wilkens, Pat Jonke, David Smith, and Patrick Grandelli from the University of Hawaii and Helene Takemoto, Allen Chin, and Charles Streck, Jr. from the POD.

1. Hi-8 videotape of the seabed identified 24 possible ordnance hazards.

2. High-resolution sidescan sonar gave preliminary evidence that the sonar records would be effective at detecting ordnance-sized manmade objects. Subsequent analysis proved this to be wrong. The resolution was insufficient to detect ordnance-sized objects. We were able to detect significant topographic features that were later confirmed with the video footage.

CATEGORY OF HAZARD: OEW.

SITE SURVEY SUMMARY SHEET
FOR
DERP - FUDS SITE SITE 3 NO. H09HI0466
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
28 FEBRUARY 1996
(continuation)

PROJECT DESCRIPTION: There is one potential project at the surveyed site. Further ordnance (OEW) may be distributed in other regions towards shore.

1. OEW. Canisters of chemical weapons and explosive waste were recovered from these sites in the course of environmental surveys undertaken on behalf of the COE in 1977. The present investigations have confirmed the locations of additional OEW and have demonstrated that the affected area is much larger than previously believed. Furthermore, it appears that the OEW extends into considerably shallower water and closer to shore than originally predicted. For these reasons, additional inventory work shoreward of the current surveys would be required to assess the extent of contamination and thus the potential hazards to that area.

AVAILABLE STUDIES AND REPORTS: Environmental Surveys of Deep Ocean Dredged Spoil Disposal Sites in Hawaii. Prepared for U.S. Army Corps of Engineers, Honolulu, Hawaii, by Neighbor Island Consultants, Contract No. DACW84-76-0032, June 1977.

PA POC: Helene Takemoto, CEPOD-ET-ES, (808) 438-6931.

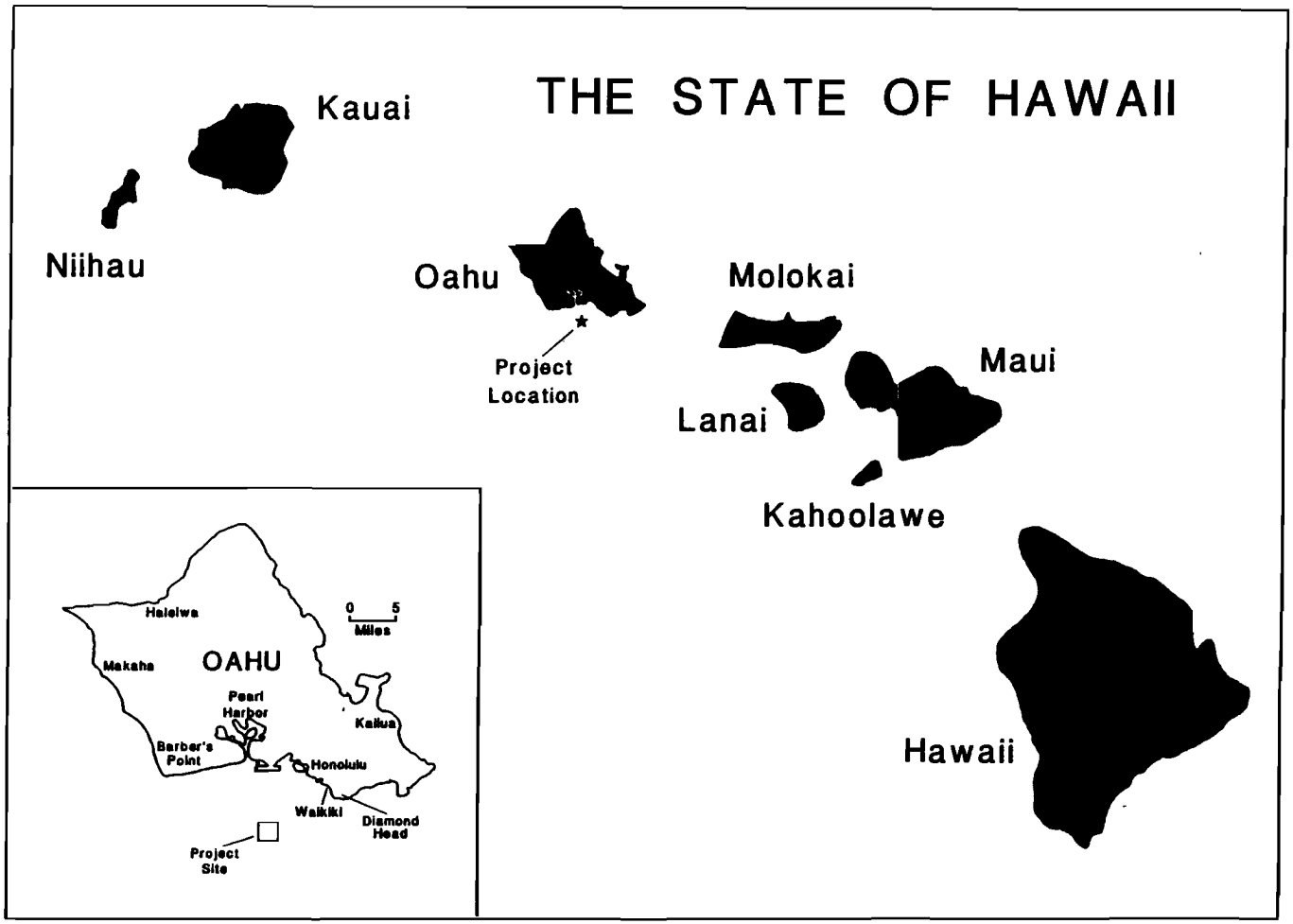

Figure 1. Location of FUDS Study Site 3 (H09HI0466).

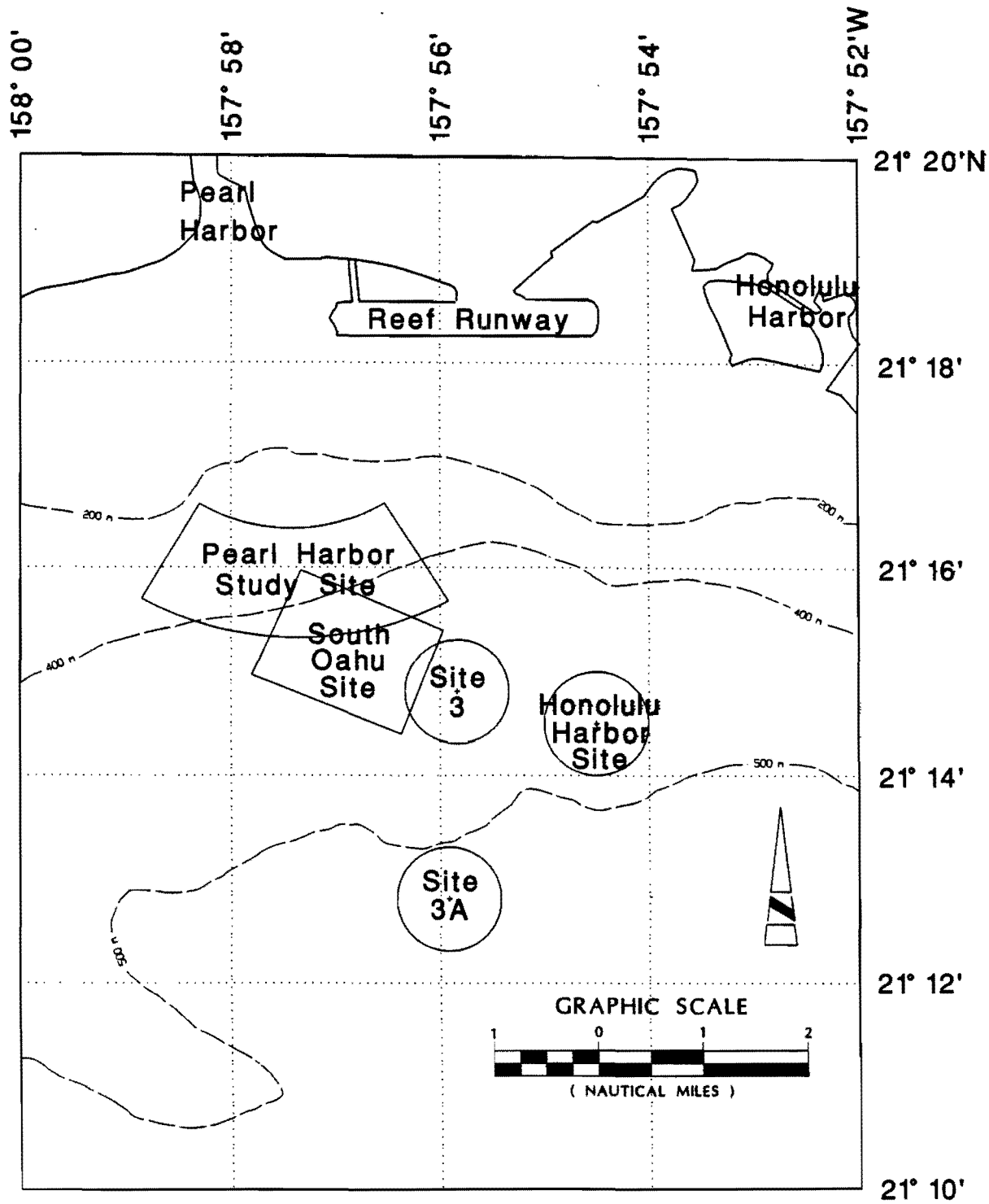

Figure 2. Location of FUDS Study Site 3 (H09HI0466) and its relation to FUDS Site 3A (H09HI0467) and dredge spoil disposal sites in Mamala Bay, Honolulu, Hawaii.

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR
FORMERLY USED DEFENSE SITES
FINDINGS AND DETERMINATION OF ELIGIBILITY
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
SITE 3 - NO. H09HI0466

FINDINGS OF FACT

1. Site 3 contains approximately 650 acres. Ordnance has been observed over an area at least twice that size. The site lies offshore of Honolulu, Hawaii in State waters. No lease, easement, permit, or other legal document granting use of the waters to the military for disposal of ordnance has been issued.

2. The site is know as Honolulu Site 3. The persons responsible for dumping the ordnance are unknown. The ordnance is all of military (DOD) origin and is scattered over the entire area of Site 3 and beyond an unknown distance. The present study has produced high resolution videotape documentation of 24 separate items that have been identified as various types of military ordnance.

3. The site is the property of the State of Hawaii. It was never declared excess or transfered to the military. Since there are no deeds or transfer papers for use of the site by the military, there are no restrictions, recapture clauses, restoration provisions, maintenace clauses or any termination agreements. There have been no intervening owners that could have contributed to the military waste. The known locations of the OEW are between 2.25 and 6 miles off the southern shore of the island of Oahu, Hawaii in water depths ranging from 250 to 530 meters. Neither the seaward extent nor shoreward boundaries of the military wastes have been confirmed.

DETERMINATION

Based on the foregoing findings of fact, the site has been determined to be formerly used by the Department of Defense. It is therefore eligible for the Defense Environmental Restoration Program - Formerly Used Defense Sites established under 10 USC 2701 et seq.

_____
Date

_____
ROBIN R. CABABA
Colonel, EN
Acting Commander

PROJECT SUMMARY SHEET
FOR
DERP - FUDS OEW PROJECT
SITE 3 NO. H09HI046601
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
28 FEBRUARY 1996

PROJECT DESCRIPTION: The initial site was designated on the basis of documentation of OEWs inadvertently recovered by researchers conducting surveys of the benthic environment in 1977. At that time, serious injuries were sustained by several researchers and crew members when canisters of chemical ordnance were unavoidably collected in their bottom trawl nets and unknowingly brought on board the ship. In addition to the chemical wastes, some 1500 lbs. of ordnance was also collected in 1977, including a 300 lb. depth charge. Our recent studies have documented, through high resolution videotapes, numerous examples of additional OEW both in the study site as well as in the surrounding areas.

PROJECT ELIGIBILITY: Given the nature of the materials recovered and videotaped, it seems readily apparent that the OEW reflects military use and contamination of state lands and waters.

POLICY CONSIDERATIONS: The historical records of at sea disposal of explosives and ordnance, and both recent and past video footage of OEW suggests that the extent of contamination by OEW is much greater than originally assumed. Given the documentation of the ordnance, particularly those pieces found north of the designated study site 3, it would seem both prudent and necessary for the government to extend the inventory to include the waters between the 50 meter and 300 meter range just seaward of Pearl and Honolulu Harbors.

PROPOSED ACTIVITIES: Proposed activities include the continuation of the present video surveys to inventory ordnance in the coastal waters from 50 to 300 meters depth immediately north of Site 3 and just seaward of Pearl and Honolulu Harbors.

RAC: Attached herewith.

PA POC: Helene Takemoto, CEPOD-ET-ES, (808) 438-6931.

RISK ASSESSMENT PROCEDURES FOR
ORDNANCE AND EXPLOSIVE WASTE (OEW) SITES

Site Name:	**Offshore Waters Honolulu, Hawaii**
Site Location:	**Mamala Bay, Oahu, HI**
DERP Project #:	**Site 3 No. H09HI0466**
Date Completed:	**February 28, 1996**
Rater's Name:	**Jacquelin N. Miller**
Phone No:	**(808) 956-7361**
Organization:	**Environmental Center, University of Hawaii**
RAC Score:	**4**

OEW RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD-882C and AR385-10. The RAC score will be used by CEHND to prioritize the remedial action at Formerly Used Defense Sites. The OEW risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews and measurements. This information is used to assess the risk involved based upon the potential OEW hazards identified at the site. The risk assessment is composed of two factors, **hazard severity** and **hazard probability**. Personnel involved in visits to potential OEW sites should view the CEHND videotape entitled "A Life Threatening Encounter: OEW."

Part I. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPE OF ORDNANCE
(Circle all values that apply)

		VALUE
A.	Conventional Ordnance and Ammunition	(10)
	Medium / large Caliber (20 mm and larger)	(10)
	Bombs, Explosive	(10)
	Grenades, Hand and Rifle, Explosive	10
	Landmines, Explosive	10
	Rockets, Guided Missiles, Explosive	10
	Detonators, Blasting Caps, Fuzes, Boosters, Bursters	6
	Bombs, Practice (w/spotting charges)	6
	Grenades, Practice (w/spotting charges)	4
	Landmines, Practice (w/spotting charges)	4
	Small Arms (.22 cal - .50 cal)	(1)
	Conventional Ordnance and Ammunition (Select the largest single value)	**10**

What evidence do you have regarding conventional OEW?
Documented recovery of depth charges and canisters believed to contain mustard gas during environmental surveys conducted in 1977. Records of visual observations of bombs, rockets, depth charges, etc. from videotapes acquired in 1994, 1995.

B. Pyrotechnics (For munitions not described above)

	VALUE
Munition (Container) Containing White Phosphorus (WP) or other Pyrophoric Material (i.e., Spontaneously Flammable)	10
Munition Containing A Flame or Incendiary Material (i.e., Napalm, Triethylaluminum Metal Incendiaries)	6
Flare, Signals, Simulators, Screening Smokes (other than WP)	(4)

Pyrotechnics Value (Select the largest single value) **4**

What evidence do you have regarding pyrotechnics?
Documented recovery of depth charges and canisters believed to contain mustard gas during environmental surveys conducted in 1977. Records of visual observations of bombs, rockets, depth charges, etc. from videotapes acquired in 1994, 1995.

C. Bulk High Explosives (Not an integral part of conventional ordnance; uncontainerized.)

	VALUE
Primary or Initiating Explosives (Lead Styphnate, Lead Azide, Nitroglycerin, Mercury Azide, Mercury Fulminate, Tetracene, etc.)	10
Demolition Charges	10
Secondary Explosives (PETN, Compositions A, B, C, Tetryl, TNT, RDX, HMX, HBX, Black Powder, etc.)	8
Military Dynamite	6
Less Sensitive Explosives (Ammonium Nitrate, Explosive D, etc.)	3

High Explosives (Select the largest single value) **0**

What evidence do you have regarding bulk explosives?
None.

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

	VALUE	
Solid or Liquid Propellants	6	
Propellants (Select the largest single value)		**0**

What evidence do you have regarding bulk propellants?
None.

E. Chemical Warfare Material and Radiological Weapons

	VALUE	
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	(25)	
War Gas Identification Sets	20	
Radiological	15	
Riot Control Agents (Vomiting, Tear)	5	
Chemical and Radiological (Select the largest single value)		**25**

What evidence do you have regarding chemical/radiological OEW?
Documented recovery of depth charges and canisters believed to contain mustard gas during environmental surveys conducted in 1976-77. Records of visual observations of bombs, rockets, depth charges, etc. from videotapes acquired in 1994, 1995.

==========

TOTAL HAZARD SEVERITY VALUE 39
(Sum of Largest Values for A through E -- Maximum of 61)

Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY*

Description	Category	Hazard Severity Value	
CATASTROPHIC	I	21 and greater	39
CRITICAL	II	10 to 20	
MARGINAL	III	5 to 9	
NEGLIGIBLE	IV	1 to 4	
**NONE		0	

***Apply Hazard Severity Category to Table 3.**

** If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF OEW HAZARD
(Circle all values that apply)

A. Locations of OEW hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other Confined Locations	4
Inside Walls, Ceilings, or Other Parts of Buildings or Structures	3
Subsurface	(2)

Location (Select the largest single value) **2**

What evidence do you have regarding location of OEW? Documented recovery of depth charges and canisters believed to contain mustard gas during environmental surveys conducted in 1976-77. Records of visual observations of bombs, rockets, depth charges, etc. from videotapes acquired in 1994, 1995.

B. Distance to nearest inhabited locations or structures likely to be at risk from OEW hazard (roads, parks, playgrounds, or buildings).

	VALUE
Less than 1250 feet	5
1250 feet to 0.5 miles	4
0.5 miles to 1.0 miles	3
1.0 miles to 2.0 miles	2
Over 2 miles	(1)

Distance (Select the largest single value) 1

What are the nearest inhabited structures?
Coastal dwellings, hotels, piers, wharfs, etc. approximately 2.5-5 miles north of the area.

C. Numbers of buildings within a 2-mile radius measured from the OEW hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	(0)

Number of Buildings (Select the single largest value) **0**

Narrative. No buildings within 2-mile radius from the oew hazard area.

D. Types of Buildings (within a 2-mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings (Select the single largest value)	**0**

Describe types of buildings in the area.
None within 2 mile radius.

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (any kind of a fence in good repair), but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	(1)

A 24-hr surveillance system (e.g. television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or
An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and
a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility). 0

Accessibility (Select the single largest value) 1

Describe the site accessibility. Located on the sea floor at depths of 450-530 meters.

F. Site Dynamics - This deals with the site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	(0)

Site Dynamics (Select the largest single value) 0
Describe the site dynamics. None.

TOTAL HAZARD PROBABILITY VALUE 4
(Sum of Largest Values for A through F - Maximum of 30)

Apply this value to Hazard Probability Table 2 to determine Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY

Description	Level	Hazard Probability Value
FREQUENT	A	27 or greater
PROBABLE	B	21 to 26
OCCASIONAL	C	15 to 20
REMOTE	D	8 to 14
IMPROBABLE	(E)	less than 8

*Apply Hazard Probability Level to Table 3.

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	(4)
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

RAC 1 Imminent Hazard -- Expedite INPR -- Immediately call CEHND-ED-SY commercial 205-955-4968 or DSN 645-4968.

RAC 2 High priority on completion of INPR -- Recommend further action by CEHND.

RAC 3 Complete INPR -- Recommend further action by CEHND.

RAC 4 Complete INPR -- Recommend further action by CEHND.

RAC 5 Recommend no further action. Submit NOFA and RAC to CEHND.

Part IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

Evidence of the presence of unexploded ordnance in the offshore waters of Honolulu and Pearl Harbors was originally documented in a Corps of Engineers Environmental Assessment study undertaken in 1976-1978. Several people were seriously injured (burned) by a yellow liquid leaking from canisters recovered in a bottom trawl. The military made a tentative identification at that time that the canisters contained mustard gas. In addition to the canisters, some 1500 pounds of shells and depth charges were also recovered in a subsequent trawl. Most recently, we have obtained confirmatory video footage of 24 pieces of ordnance in the same general area as the materials recovered in the environmental surveys. The ordnance that has been detected during this inventory has been in water depths of 250-530 meters. At these depths the danger to humans or structures is exceedingly remote. However, since the videos indicate that many of the ordnance objects (if not all) remain at the surface of the seafloor, despite the many years of dumping of dredged material in the general area, it seems quite likely that if ordnance does occur in shallower, nearshore waters that it has not been buried and thus may present a potential hazard.

COST ESTIMATE

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR
FORMERLY USED DEFENSE SITES
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
DERP - FUDS OEW PROJECT
SITE 3 NO. H09HI0466
28 FEBRUARY 1996

The attendant DD Form 1391 contains a cost estimate to remediate the Offshore Waters, Honolulu Site 3 located in Mamala Bay, Southern Oahu pursuant to RAC 4 requirements.

REMEDIAL DESIGN

1. ENVIRONMENTAL COMPLIANCE. Environmental compliance includes the preparation of permits that may be required for operations in the coastal water of the State of Hawaii. These permits may include, Fish and Wildlife and other federal, state, or local environmental quality control requirements including Section 7 threatened/endangered species consultation, and NEPA documents.

Cost Breakdown:

Preparation of Permits, Clearances	150,000
Total	150,000

2. ENGINEERING AND DESIGN. Work plans, site safety and health plans, and other plans as required by the proponent.

Cost Breakdown:

Preparation of Plans, Reports	150,000
Total	150,000

REMEDIAL ACTION

1. MOBILIZATION AND PREPARATORY WORK. Mobilization of equipment and facilities.

Cost Breakdown:

Mobilization of Ships, Equipment & Facilities	20,000
Total	20,000

COST ESTIMATE

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR
FORMERLY USED DEFENSE SITES
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
DERP - FUDS OEW PROJECT
SITE 3 NO. H09HI0466
28 FEBRUARY 1996
(continuation)

2. SURVEY, DISCOVERY, INVENTORY, DEMOLITION AND REMOVAL. The cost estimate for the ordnance survey and removal assumes that the ordnance is present throughout Site 3. However, our surveys indicate that it likely extends to twice that area, or a total of about 1300 acres. Given the depth of the location of the ordnance and its age and condition, there appears to be no safe way to remove the ordnance from the bottom and move it to the surface for transport to a disposal site. The deteriorating condition of the munitions and the pressures involved would make transport to the surface unacceptably hazardous. Demolition on site would be possible using remotely operated vehicles (ROV's) to plant appropriate sized demolition charges. Based on the inventory work to date, we can estimate the density of the ordnance at 1 per acre hence approximately 650 ordnance items can be expected to occur in Site 3. The OEW clearance effort is based on a team of 20. This would include a video survey team, ROV specialists and technicians, GPS position specialists, and OEW support specialists. Discovered ordnance would be inventoried on video tape, marked using differential GPS positioning systems, tagged with an acoustic transponder, and detonated in place by demolition charges planted by the ROV. Quality assurance and quality control would be assured by follow-up video images of the detonation site.

Cost estimates are based on removal of 650 ordnance items in site 3, (density of 1/acre) and assuming demolition of 2 items per day.

Cost Breakdown (Site 3 only):	
Ship time @ 8000/day * 325 days	2,600,000
Survey Team (20) @ 12,000/day * 325 days	3,900,000
Equipment (ROV, DGPS, Video, Transponders, Explosives)	2,500,000
Total	9,000,000

Note: Ordnance has been observed over an area at least twice the size of site 3, or approximately 1300 acres. Cost figures shown reflect cost/650 acres only.

COST ESTIMATE

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR
FORMERLY USED DEFENSE SITES
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
DERP - FUDS OEW PROJECT
SITE 3 NO. H09HI0466
28 FEBRUARY 1996
(continuation)

3. DISPOSAL. Disposal is not feasible without transport to the surface. This, in turn, is not feasible due to the condition of the ordnance and pressure differences that the munitions would be subjected to in the moving process.

4. DEMOBILIZATION.

Cost Breakdown:	
Demobilization of Equipment and Return Shipping	20,000
Total	20,000

5. CONTINGENCY (10% of total remedial cost)	934,000
6. EDC	75,000

1. COMPONENT	FY 19 ____MILITARY CONSTRUCTION PROJECT DATA	2. DATE
ARMY		28 Feb 1996

3. INSTALLATION AND LOCATION	4. PROJECT TITLE
Offshore Waters of Honolulu, Hawaii	Site No. 3

5. PROGRAM ELEMENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT COST ($000)
DERP-FUDS	OEW	H09HI0466	$9,505.90

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
REMEDIAL DESIGN				
1. Environmental Compliance Permit Requirements	LS			150.0
2. Engineering and Design	LS			150.0
REMEDIAL ACTION				
1. Mobilization	LS			20.0
2. Demolition/Removal	LS			9,000.0
3. Disposal	LS			NA
4. Demobilization	LS			20.0
5. Contingency (10%)	LS			934.0
S&A (8.5%)				793.9
EDC				75.0
TOTAL				11,142.9

10. DESCRIPTION OF PROPOSED CONSTRUCTION

Perform surface and limited subsurface survey and clearance of OEW.

FIELD SURVEYS

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR
FORMERLY USED DEFENSE SITES
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
DERP - FUDS SITE 3 NO. H09HI0466
FEBRUARY 28, 1996

Sonar:

An EG&G DF 1000 sidescan sonar was used to detect high acoustic reflectivity surface objects over the entire area of site 3, as well as some coverage of the area just south of the site (fig. 3). Line spacing was 300m. The sonar uses two each 100khz and 400khz beams, and reportedly provides across-track resolution of <.1m, and along-track resolution < 0.5m. Nominal resolution was thus expected to be $(.5m)^2$. In practice, this resolution was not achieved.

Data collection was observed real-time and was processed into .5m/pixel gray scale mosaics presenting an aerial view of the survey area (Appendix B). Numerous large (> 10m) objects were detected. Small individual objects appeared singly and in groups distributed throughout the survey area but were of insufficient resolution to be useful in the identification of ordnance. The large objects were clustered in the northern region of Site 3.

The large irregular features recorded on the side scan images in the northern area of Site 3 proved to be massive coral or basaltic outcrops with 30 meter or more vertical walls and generally rugged, irregular, terrain.

Video:

Approximately 12.75 miles of video footage was obtained using a Hi-8 format fiber optic videocamera with a pressure-capable housing suspended from a fiber optic cable approximately 2-5 meters above the seabed. Two halogen lights on booms provided the illumination. The camera's field of view encompasses from one to four meters depending on its height (altitude) above the sea floor. Figures 4, 5, and 6 illustrates the paths of seabed video taped and analyzed by University of Hawaii researchers and DEI consultants. Many objects were identified ranging from beer bottles to large electric motors.

Video footage taken by the Hawaii Undersea Laboratory (HURL) provided additional documentation of the presence of unexploded ordnance. Twenty four ordnance hazards were identified and are listed in Table 1, and their locations are shown on Figure 7 (Appendix B).

Hawaii Undersea Research Laboratory Videos. The Hawaii Undersea Research Laboratory (HURL) of the University of Hawaii maintains and operates two submersibles that have in the past been used near the Mamala Bay disposal sites. The *Makali'i* was used from 1981 through 1986 and made 13 dives as part of a dredge spoil study project. Six dives were made with the *Pisces V* of which one was made in approximately 1000 feet of water north of the study area in 1992.

Voice transcripts and transcribed video logs from all dives in the general vicinity of the study site were reviewed for reference to ordnance. Videos of the dives where ordnance were sighted were viewed and still images were made of all ordnance identified. The sound tracks of the video tapes made by the submersible crew frequently discussed seeing ordnance that was not necessarily filmed by their cameras. Hence, examples of references to ordnance in the voice transcripts are submitted with the still images as additional data (Appendix B).

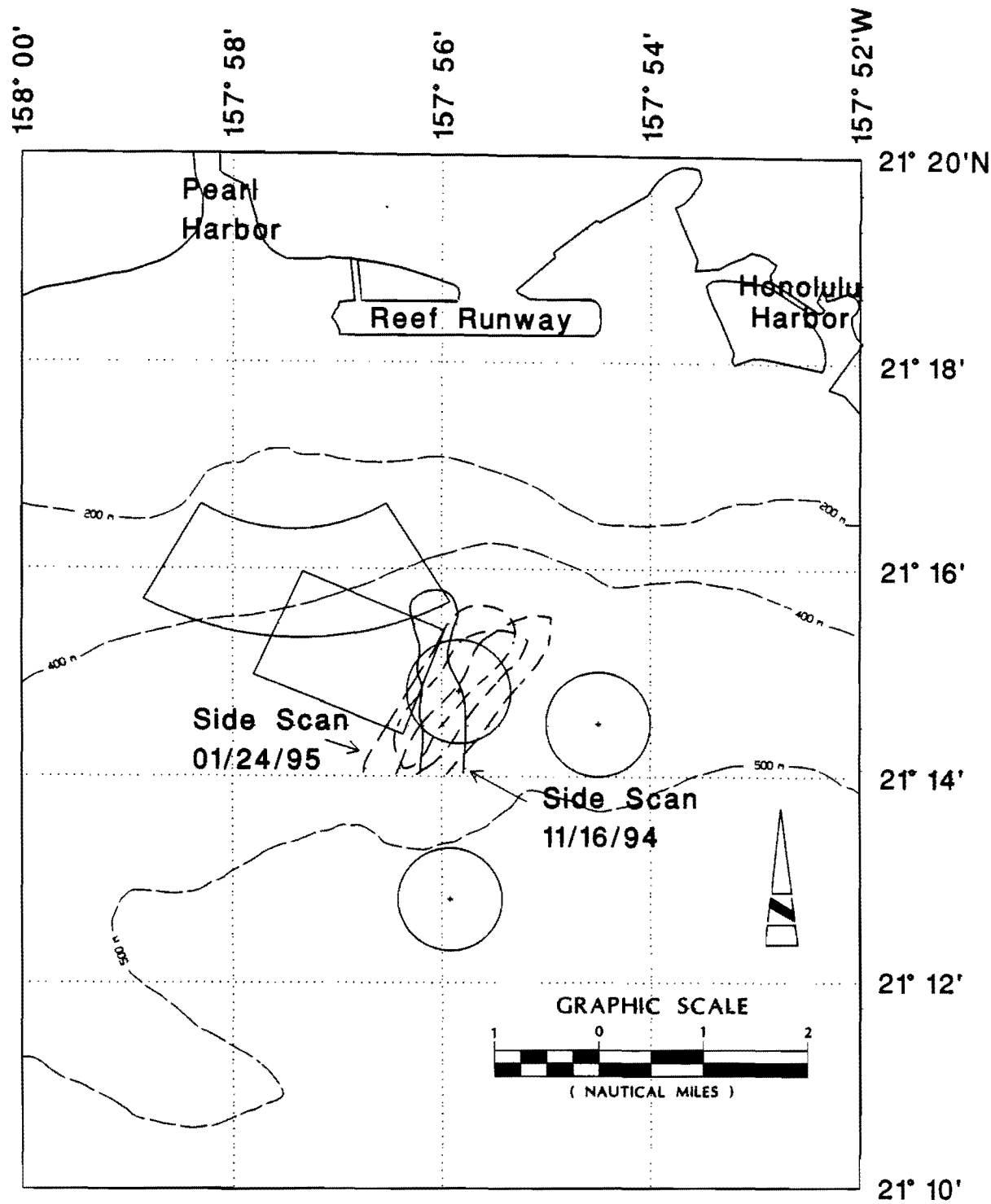

Figure 3. Side scan sonar cruise locations.

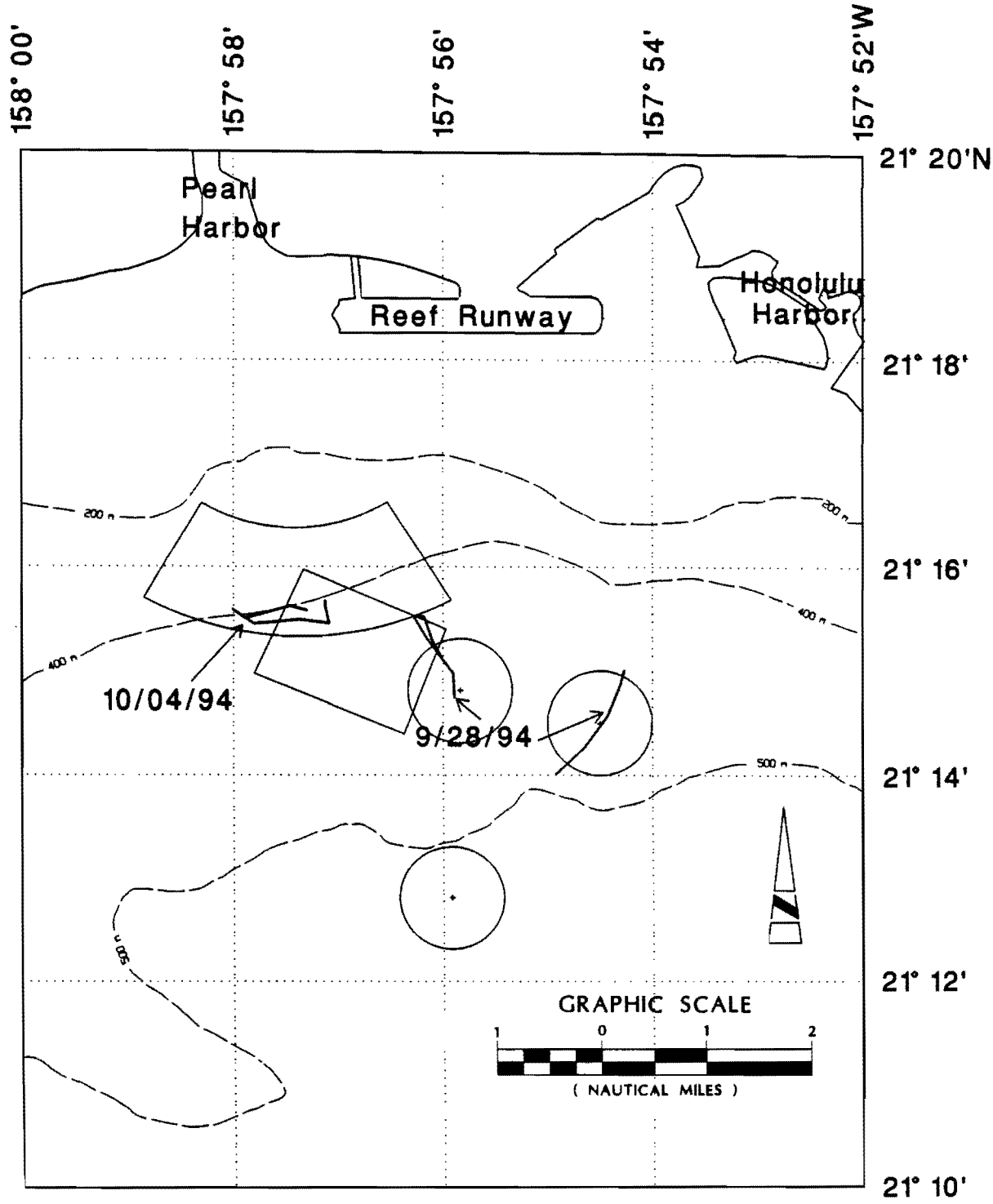

Figure 4. Location of video transects made on September 28, 1994 and October 4, 1994.

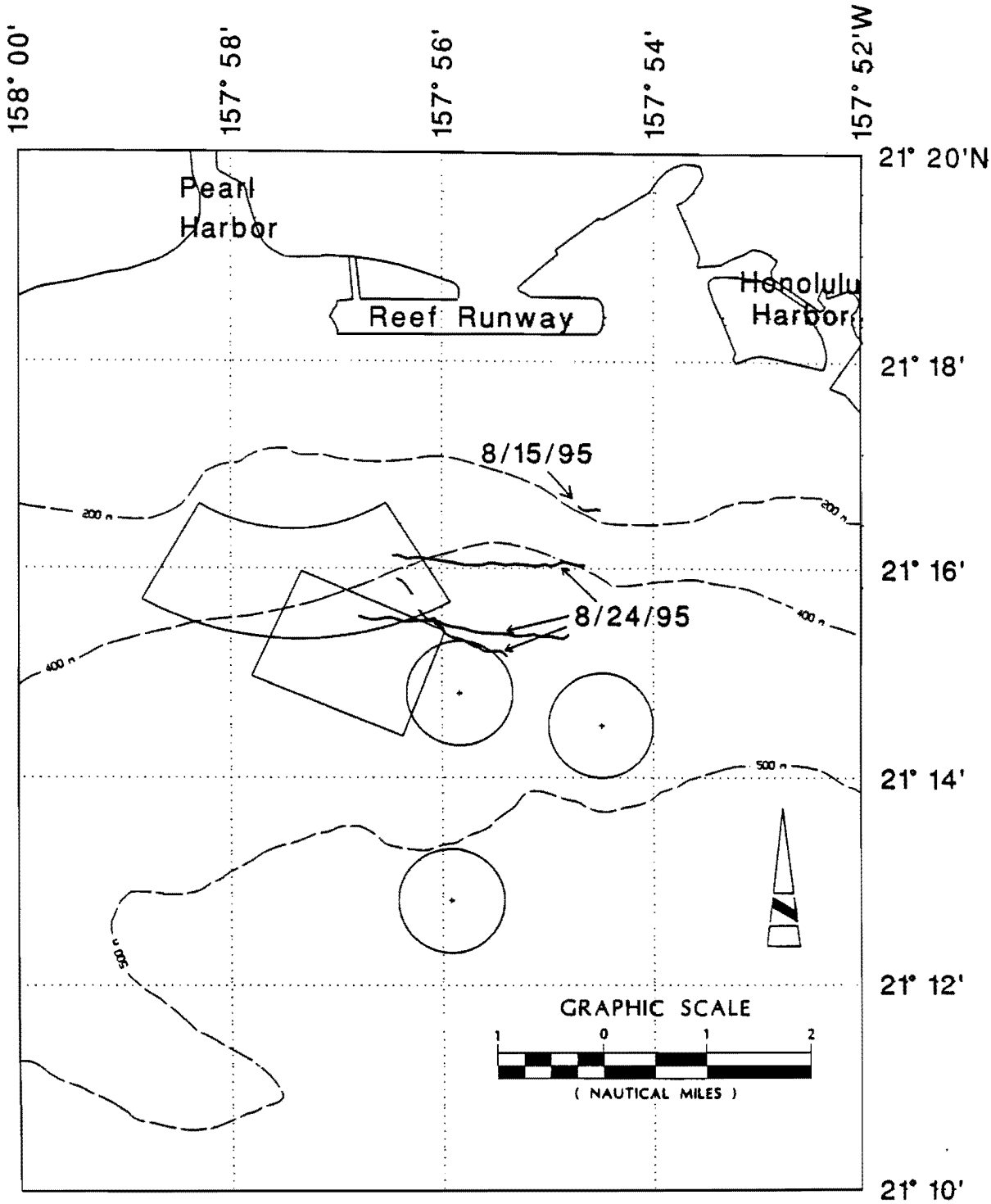

Figure 5. Location of video transects made on August 15 and 24, 1995.

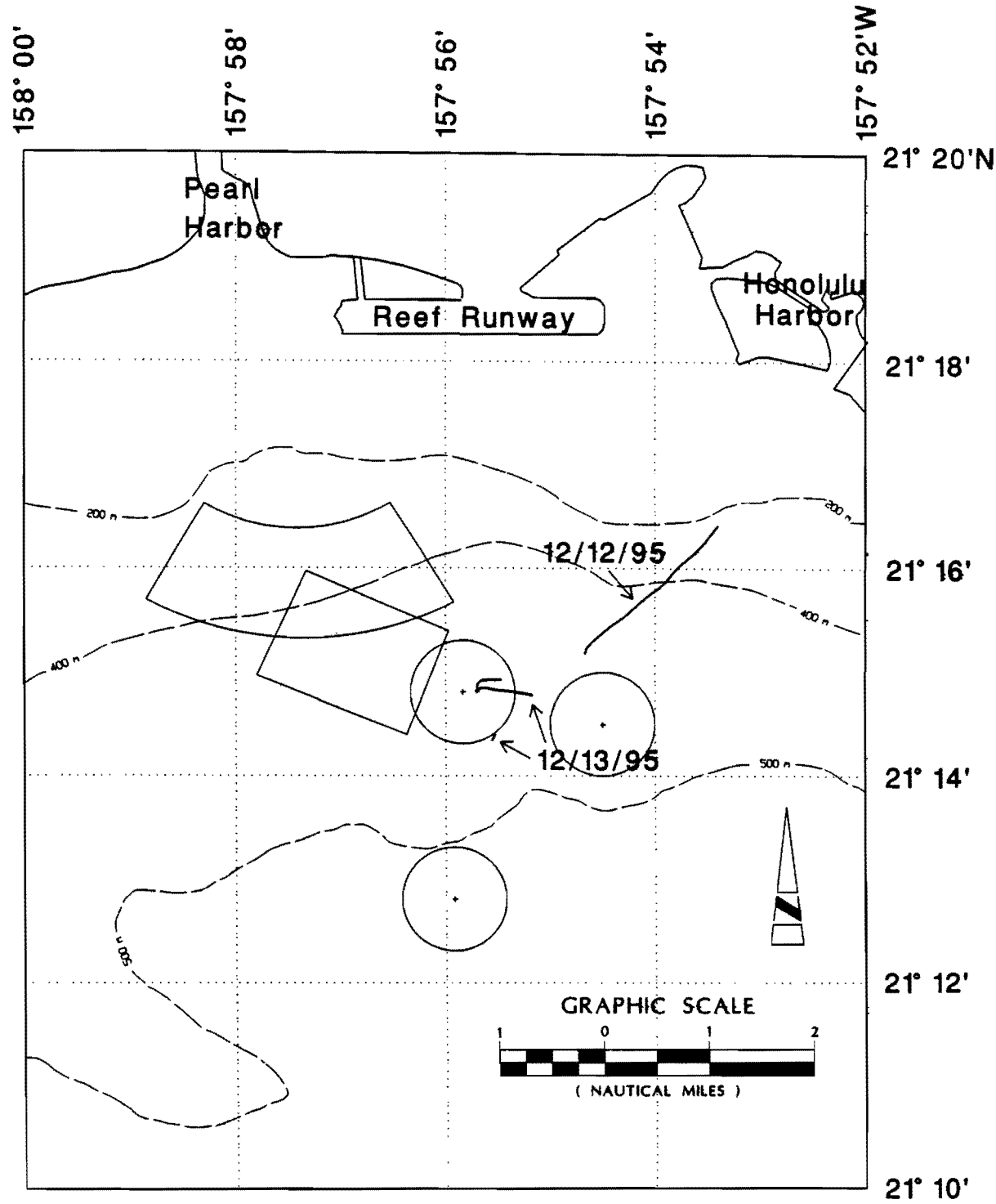

Figure 6. Location of video transects made on December 12 and 13, 1995.

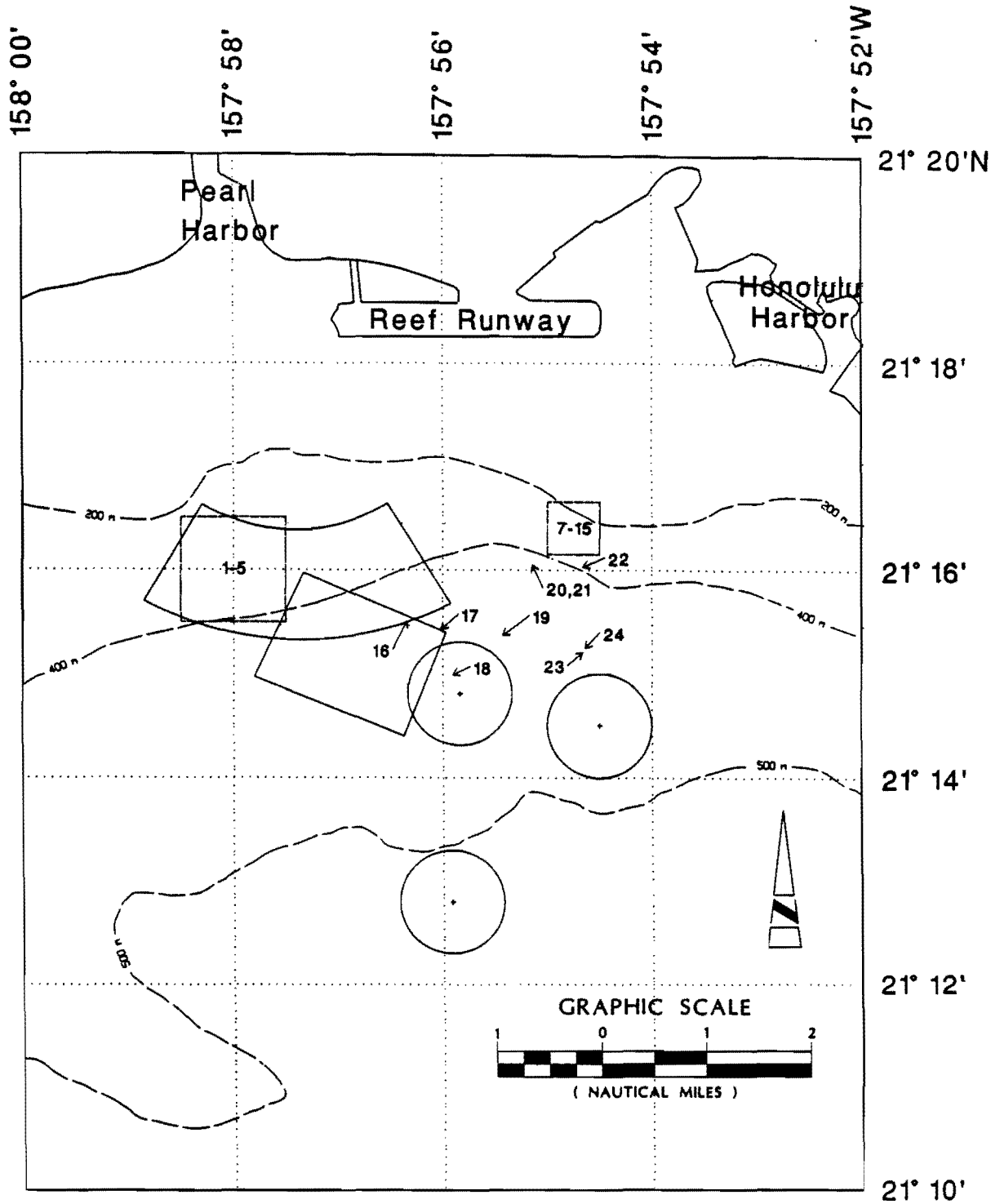

Figure 7. Location of ordnance and explosive wastes as recorded on videotape. Numbers correspond to ordnance identifications listed in Table 1 as provided by Donaldson Enterprises, Explosive Ordnance Disposal Specialists.

FUDS/FOCUS Video/Ordnance Locations				
Site 3				
Item No.	Description	Longitude	Latitude	Survey
		(157 deg)	(21 deg)	
1	Depth Charge, Torpex.	58	16	P5-200
2	Naval Projectile, 8" to 16".	58	16	P5-200
3	Projectile, Possible 40mm.	58	16	P5-200
4	Depth Charge, Amatol Filler.	58	16	P5-200
5	Projectile, 8" to 16", Explosive "D" Filler.	58	16	P5-200
6	Naval Artillery Shell 8" to 16", Explosive "D" Filler.	58	16	P5-200
7	Naval Artillery Shell 3" to 16", Explosive "D" Filler.	54.7	16.4	82-87
8	Naval Artillery Shell, Explosive "D" Filler.	54.7	16.4	82-87
9	Naval Artillery Shell, Explosive "D" Filler.	54.7	16.4	82-87
10	MK 50 Mech Time Fuse, Black Powder Filler.	54.7	16.4	82-87
11	Depth Charge, Torpex.	54.7	16.4	82-87
12	Mine.	54.7	16.4	82-87
13	Projectile, 8" to 16".	54.7	16.4	82-87
14	Naval Artillery Shell 8" to 16", Explosive "D" Filler.	54.7	16.4	82-87
15	MK 50 Mech Time Fuse, Black Powder Filler.	54.7	16.4	82-87
16	Projectile Shape w/Deposits of Residue in General Area.	56.34	15.51	8/24/95
17	Projectile.	56.02	15.43	8/24/95
18	Cylinder with Fin Configuration.	55.91	14.99	9/28/94
19	Flat Circular Plate or Base of Projectile.	55.43	15.37	8/24/95
20	Projectile.	55.14	16.05	8/24/95
21	Bomb (100-250 lb.). Configuration Suggests Chemical.	56.33	16.09	8/24/95
22	Small Arms Ammunition.	54.66	16.03	8/24/95
23	3" Cartridge Case and Round.	54.66	15.21	12/12/95
24	Projectile, Possibly 8".	54.64	15.25	12/12/95

Table 1. Location and description of ordnance video taped during FOCUS transects and HURL surveys. Ordnance identified by Donaldson Enterprises.

SOURCES OF INFORMATION

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR
FORMERLY USED DEFENSE SITES
OFFSHORE WATERS, HONOLULU, HAWAII
MAMALA BAY, ISLAND OF OAHU, HAWAII
SITE 3 NO. H09HI0466
28 FEBRUARY 1996

DISCUSSION

The purpose of this section was to uncover historical evidence of ordnance disposal at Site 3 in the offshore waters of Mamala Bay, Honolulu, Hawaii. Various military commands were contacted for information regarding possible locations of historical records of ordnance disposal in these waters. Historical files, documents, and the Honolulu newspapers were systematically searched.

Appropriate contacts for the various military commands were obtained through referrals from a superior command to the applicable subordinate command. As a former Navy officer, one member of our staff used his knowledge of the Hawaii naval force structure in locating possible sources of information pertinent to ordnance disposal at sea.

Historical research proved to be frustrated by a lack of data, probably caused by the long time span (~50 years) involved. It was found that newspapers provided useful accounts of ordnance discoveries by the public, or of major incidents, but little record of ordnance inventories seemed to be available. Beginning in the mid-1970's, it appears that more data was available. This may be due to the United State's environmental awakening, administrative rules governing records-keeping, or both. The nature of "disposal" may have contributed to the paucity of information since there was probably little concern to keep records of items being discarded.

REFERENCES

1. Environmental Surveys of Deep Ocean Dredged Spoil Disposal Sites in Hawaii. Prepared for U.S. Army Corps of Engineers, Honolulu, Hawaii, by Neighbor Island Consultants, Contract No. DACW84-76-0032, June 1977.

2. Federal Hazardous Waste Sites in the State of Hawaii, Hearing before the Committee on Governmental Affairs, United States Senate, August 20, 1990. U.S. Government Printing Office, Washington, DC, 1992.

3. Hawaii War Records Depository, (59 microfilms covering 1941-1945). Hamilton Library, University of Hawaii at Manoa, Honolulu, Hawaii.

4. Honolulu Advertiser Newspaper, Honolulu, Hawaii, 1929 - 1994.

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6. Submerged Cultural Resources Study, USS Arizona Memorial and Pearl Harbor Historic Landmark, Daniel J. Lenihan, ed. National Park Service, U.S. Department of the Interior, 1990.

7. United States Coast Pilot 7, Pacific Coast, California, Oregon, Washington, and Hawaii, 10th ed. (June 15, 1968), U.S. Department of Commerce. U.S. Government Printing Office, Washington, DC, 1968.

8. World Naval Weapons Systems, Norman Friedman. Naval Institute Press, Annapolis, Maryland, 1989.

9. 40 Code of Federal Regulations, Section 227-8.

LOCAL NEWSPAPER ARTICLES

Honolulu Advertiser = HA
Honolulu Start-Bulletin = HSB
The Hawaii Weekly = THW

mo.	dy.	yr.	Paper	Title of Article	Details
1	28	1933	HSB	FUNDS TO STORE EXPOSIVES HERE SAFELY SOUGHT	Use of Salt Lake Crater, Ford Island, and Bishop's Pt. for storage of bombs.
7	5	1946	HA	SHELLS STREW RABBIT ISLE, SCENE OF FATAL EXPLOSION*	DUD shell cleanup is urged.
7	23	1946	HSB	NAVY GIVES WARNING OF DANGER AREAS...	Unexpended projectiles may remain near bombing target rafts anchored off Barbers Point.
9	15	1946	HA	BOMB DISPOSAL SQUADS EXPLODE DUD MISSILES	"Kahuku to Koko Head squads worked to rid the ocean bottom of missiles fired during war time practice games."
6	20	1954	THW	HAWAII'S WAR AGAINST THE DUD	"From 1946 to 1948 disposal teams dumped empty casings out at sea."
5	10	1956	HA	LIVE ROCKETS FOUND OFF ALA MOANA	Two 3.5 inch bazooka rockets, anti tank projectiles found beyond the reef.
8	23	1956	HSB	NAVY BOMB DISPOSAL UNIT CAN AFFORD NO MISTAKES	"We dispose of most bombs by blowing them up on the spot."
11	8	1956	HSB	MINES ON WATER STILL WAGE WAR...	Eleven WW II mines washed ashore in 18 months on Hawaii's Beaches.
1	15	1957	HSB	DEMOLITION TEAM REMOVES DEVICE	Harbor closed two hours. Demolition teams removed a floating mine from Honolulu Harbor.
8	19	1963	HSB	DIVERS SALVAGE ANCIENT CANNON	Russian ??600 lb. cannon found in Honolulu Harbor at 35 ft. depth, 100 yds. from channel entrances.
11	7	1965	HSB	EODU MEN DIVE DEEP TO DEFUSE EXPLOSIVES	Training of EOD personnel.

5	23	1966	HSB	UNDERSEA EXPLOSION SLATED TOMORROW	Reference to disposal of obsolete ammunition at sea by the Navy.
8	22	1966	HSB	BOMB BLOWN UP AT MAKUA BEACH	WW II, Mark 37, 500 lb. bomb found in 15 ft. of water at Makua Beach.
4	21	1970	HSB	NAVY TO DETONATE BOMBS ON TINY ISLAND TOMORROW	Disposal of live bombs on Mokuhooniki Island off Molokai resulting from bombing practice.
9	15	1970	HSB	RADIOACTIVE WASTE IN PEARL HARBOR	Discharge of radioactive waste water from nuclear submarines into Pearl Harbor.
4	1	1972	HA	BIG PEARL HARBOR CLEANUP UNDERWAY	General "clean-up" of debris, litter and wreckage, in Pearl Harbor.
5	10	1973	HA	1941 JAPANESE BOMB RECOVERED	Navy divers recovered 1941 bomb 70 ft. deep, 1,000 ft. off Waialua. Wahiawa police requested that Navy dive team check out bomb report.
3	31	1977	HA	BOMB FOUND AT PEARL	Bomb discovered on Ford Island thought to be from 1941 Pearl Harbor Attack.
6	9	1977	HSB	CONSTRUCTION WORKERS FIND A DUMMY BOMB	A 2000 lb. bomb was unearthed near Pearl Harbor and was taken to Makua for disposal. Bomb turned out to be a dud.
6	19	1982	HSB	MORE OLD BOMBS DETONATED*	Kent Warshauer to write a book on the impact of military ordnance here in WWII shed light on the findings.
5	3	1991	HA	PEARL HARBOR YIELDS WWII TORPEDO	A Japanese aerial torpedo with 600 lb. of explosives was dredged up near Ford Island. It will be detonated at sea.
5	4	1991	HA	INOUYE: KAHOOLAWE FACES HURDLES	Opposition of Congress to return of Kahoolawe to state and potential for future military use.
5	23	1991	HA	A TORPEDO'S TALE--IN TIME FOR 50TH	Remains of Japanese torpedo dropped on December 7, 1941, recovered from Pearl Harbor.

10	30	1992	HA	NAVY CLEANING UP WASTE SITES	Addition of Pearl Harbor to EPA's Superfund List and use of Department of Defense monies to clean up hazardous waste sites at Navy facilities on Oahu.

**Articles regarding disposal practices*

TEXTS, JOURNALS, REPORTS other than newspapers:

1	Committee on Governmental Affairs, U.S. Senate, 8/20/90 FEDERAL HAZARDOUS WASTE SITES IN THE STATE OF HAWAII COMPLIANCE, CLEANUP AND WASTE MANAGEMENT	"the NEW YORK and the NEVADA ships were towed to sea and used as torpedo targets and then sunk off of Pearl Harbor in July of 1948."
2	Recommendations for the disposal of Chemical agents and Munitions. THE CHEMICAL STOCKPILE. National Research Council, Washington D.C., 1994	
3	MANAGEMENT AND DISPOSITION OF EXCESS WEAPONS National Academy Press, Washington D.C., 1994	
4	HEAVY METALS SURVEY AND THE ESTIMATION OF SEDIMENT YIELD: MAUKA MILITARY RESERVATION A thesis by Alvin Char, MPH, University of Hawaii, 1977	Ocean water quality studied in this report covers: Sediment yield delivered to nearshore ocean waters. Concentrations of metals found in disposal site soils. Potential runoff during heavy rains. Pg. 43. "The Navy, on behalf of the Armed Forces, established a practice of ocean dumping as the safest and most effective method of disposal."

CONFERENCE, VIDEO OF

1	WEAPONS TECHNOLOGY AND ETHICS- CONVENTIONAL WEAPONS DISPOSAL ON OAHU. Pat Tummons and John Harrison, 1994.	Weapons disposal may occur at the end of training sessions, but will be classified as training, not weapons disposal. Disposal during training is not regulated.

SOURCES AND TOPICS SEARCHED

NEWSPAPER INDEX:

* The Hawaii Weekly (THW)
* Honolulu Advertiser (HA)
* Honolulu Star-Bulletin (HSB)
  1928-1984 Bound guide to articles
  1991-1994 Public Library Terminal
  Hawaii State Library

Topic Headings Searched:
Accidents
Ammunition
Army
Arsenals Waste
Artillery
Bombs
Dumping
Explosions
Explosives
Hazardous Waste
Honolulu Harbor
Military
Mines
Missiles
Munitions
Ocean Dumping
Ordnance
Pearl Harbor
Pollution
U.S. Armed Forces
U.S. Navy
U.S. Ordnance Disposal Units
Waste
Weapons
West Loch
World War

UNIVERSITY LIBRARY SYSTEMS:

* Hamilton: Gov. Docs, Hawaii/Pacific Reserves
* Governmental Publications
* Sinclair Audio Visuals

Topic Headings Searched:
Arsenals Waste Disposal
Defense Sites Hawaii
Disposal of Chemical Weapons
Explosive Ordnance Disposal
Formerly Used Defense Sites Hawaii
Hazardous Waste Sites Hawaii
Military Bases Waste Disposal
Naval Ordnance Disposal
Obsolete Conventional Ordnance Disposal
Toxic Explosives
United States Armed Forces Ordnance Facilities
Waste Disposal in Ocean
Weapons Disposal Hawaii
Weapons Testing Areas Hawaii

FUNDS TO STORE EXPLOSIVES HERE SAFELY SOUGHT

Houston Says Bombs, Shells Dangerous To Civil and Military Communities

Star-Bulletin Bureau,
Washington, Jan. 25.

The war department has not abandoned the plan to develop Salt Lake crater as an ammunition storage base for the army, but will probably have to delay further improvements until congress is ready to provide about $825,000 to complete the project, it is learned here this week.

In recent hearings before the house appropriations committee, Delegate Houston successfully urged the appropriation for the next fiscal period of $74,000 for reinforcing the existing storage facilities of the army in Hawaii in order to lessen the danger to local residents.

"There is still a great deal of ammunition storage about Hawaii," Houston said, "and a great deal about the city of Honolulu, in makeshift facilities, as well as at a magazine at the north end of Ford island in Pearl Harbor, which never was intended for storage of high explosives, and in a casemate at Bishop point, halfway up the eastern shore of the navigable entrance to Pearl Harbor.

Bombs Dangerous

"Both at Ford island and at Bishop point aviation bombs are stored at the present time, and in the case of Ford island there is danger to human habitation, which is in the very neighborhood, probably not more than 1,000 feet away. In the case of Bishop's point there is danger to the channel development.

"In Honolulu, at the site across the way from the so called ordnance depot, there is still a quantity of ammunition stored in temporary buildings which were put up during the war; old hangars, and in that instance there are an accumulation of artillery munitions, equivalent to about 40,000 rounds of 155 millimeter, or 60,000 rounds of 75 millimeter, and that is at the present time located at a minimum distance of 300 feet from occupied civil dwellings, the nearest point from the nearest so called magazine.

Close to Hospital

"From the center of the explosive area to the nearest civil quarters is 700 feet, and from the center of this explosive area to the nearest point of the departmental hospital is about 1,050 feet.

"The New Jersey law, which has been referred to, which has to do with army and navy storage conditions, contemplates a two mile safety zone for high explosives, and contemplates that magazines of the type which this represents should be at least 1,900 feet from an inhabited dwelling, and 370 feet from a highway.

"There have been a number of galleries already completed (at the Salt Lake crater storage project), but these require relining, and the sum of $80,000 (reduced to $74,000 by the committee) has already been given me as the amount estimated to put these galleries into condition for receiving and storing ammunition.

"It seems to be urgent that this ammunition should be removed as early as possible from a position endangering property and persons nearby."

HONOLULU ADVERTISER, July 5, 1946

Shells Strew Rabbit Isle, Scene Of Fatal Explosion

By GERRY BURTNETT

Sudden death stalks Rabbit island today.

With Advertiser photographer Danny Morse we hired a Waimanalo bay fishing crew, captained by 73-year-old Alona Wong who made the accidental discovery of five teen-agers, one of whom was killed and the other four seriously wounded, by an unexploded missile on Rabbit island.

Wading ashore in a high surf we tramped down the beach to where the explosion had killed James Sasaki, 17, of 227 Maunalua Ave. We skittered like persons traversing a mine field on Okinawa as we unexpectedly discovered two more unexploded shells of the same type that turned the overnight fishing party of five into a bloody shambles.

Rabbit Island Arsenal

Running our hands through the sands of Rabbit island's now unfriendly shores we came up with more than two pounds of 50 caliber tracer bullets. Later when we poked into little pukas in the surf swept coral and saw rotting steel devices that resembled bomb detonators and other explosive materials, we began to feel that Rabbit island was not a place to dwell overlong.

Fishermen told us that almost every day, from the shores of Waimanalo, puffs of smoke can be seen bursting into the trade winds. They estimate that these are the same type of unexploded missiles, forced into explosion by the action of the sun, wind and waves.

Fishing Trips

The party that took off Wednesday night for a barbecue and fishing on the island was a duplicate of those Captain Wong has been delivering for 25 years.

There were several boys and an older man to see that things did not get out of hand. Wong charged $2 a head, his standard price, "$1 go, $1 come." He was to pick them up and return to the anchorage point near the Shriner's summer home about 8 a.m. Thursday.

A few minutes before 8 Captain Wong, Joseph Alona Wong and Samuel K. Kumai, on the boat Namahoe, were approaching their rendezvous. They heard a terrific

(Continued on Page 6, Col. 6)

Navy Gives Warning of Danger Areas Where Duds Still Remain

Vice Admiral John L. Hall Jr., commandant of the 14th naval district, today issued a summary of danger areas in the Hawaiian islands which should be avoided because of the presence of unexploded projectiles.

The admiral said the areas are well marked with danger signs and exist on portions of Hawaii, Molokai, Kahoolawe, Necker and Molokini.

Sites on these islands are presently being used by the navy for gunnerly, rocket and aircraft bombing exercises.

\# \# \#

Admiral Hall emphasized that there are no naval target areas on the island of Oahu.

He said the island of Kahoolawe is especially dangerous, as it is the scene of frequent gunnery and bombing practices.

\# \# \#

On the west coast of Molokai, just south of lio point, there is an aircraft rocket range.

"The limits of the range are well posted with warning signs and in the interest of safety the areas should not be trespassed. Also, off the eastern tip of Molokini, which lies between Kahoolawe and Maui."

\# \# \#

On Hawaii, the Dau desert is used by the navy as a target practice area. This lava deposit is on the southeast portion of Hawaii, located south of Kilauea crater.

\# \# \#

An aircraft bombing range exists on Necker island, 290 miles north of Kauai.

While actual use of these ranges is not as frequent as during the war, there is still the possibility that firing and bombing will take place at any time, Admiral Hall said.

In addition, there are bombing target rafts anchored in waters near four of the islands. Two such rafts are anchored off Oahu, near Barber's point and Kaena point.

Others are off Molokai, Lanai and Maui.

Pleasure boats are warned to keep clear of the rafts.

ETRIEVED—Duds that fell on Oahu during the war period, nearly all of
ow being searched out and gathered up by the army from the land and from
n. In this picture Technical Sergeant Carl A. Hodges of the 212th ordnance
brings up from the ocean bed a spotting bomb once used by the navy. The
aters off Oahu of these duds in an area 100 feet offshore from Koko Head to

Bomb Disposal Squads Explode Dud Missiles

Explosions seen along the shore and in the water off Windward Oahu were explained yesterday by the army's Oahu ordnance service. The blasts are the result of demolition of duds being supervised by the ordnance 212 bomb disposal squad in an almost superhuman effort to rid the shore and ocean bottom of missiles which were fired during wartime practice games.

The task seems to be an endless one, an ordnance spokesman said. Because an area is completely cleared of duds one day does not mean that the same area will be free of such danger a day, week, or even a year later.

An example of this situation was the shells found on Rabbit Island and the tragedy which struck several youths there on July 4. The shoreline of the island was policed and cleared of dangerous missiles by field artillery and ordnance units last January, but apparently the action of normal tides, and the added upheaval of the tidal wave on April 1, was responsible for uncovering duds that had been buried deep.

Still Find Old-Timers

It was pointed out that in some parts of the mainland cannon balls and shells which were fired during the Civil War are still being unearthed, and farmers in France were plowing up duds from the first world war up to the time of the invasion in 1940.

Starting at Kahuku and working their way down the shore to Koko Head, 34 men of the 79th engineers and 865th AAA battalion, are locating and destroying duds under the guidance of the bomb disposal squad. The day's operation begins at 7 when

(Continued on Page 4, Col. 6)

a mighty blast is caused by a supposedly harmless group of shells that were found in the sand. Fortunately they were not found by some curious passer-by. In the picture second from the right a column of water 150 feet high is caused by the explosion of duds found under water. At the far right bomb disposal men slip into the water to attach an explosive charge to the duds 20 feet under. (Army Photos.)

Bomb Disposal Squads Explode Dud Missiles

(Continued from Page 1)

the men hop into a duck, an amphibious 2½ ton truck, which is used to carry the men and explosive charges and equipment to the beach.

Arriving at the scene some of the men begin combing the beaches for missiles, others go into the water, searching the ocean floor as far as 100 feet from shore.

Completion of the underwater detonation will take a long time, an ordnance spokesman said, due to the limited period the men can remain under water. (Only face pieces, of the type used by local spear fishermen, are worn by the men.

DISARMING A DUD — An ordnance officer takes the firing device from the warhead of a 2,000-pound anti-shipping bomb on tiny Molokini island between Maui and Kahoolawe. The island was used for dive-bombing target practice during World War II. In 1946 an engineer bomb disposal team of island men cleared the island of duds such as this one. (Gordon Morse photo.)

DUD DISPOSAL TEAM—If you should find a dud, this group of men should be called. They comprise the USArPac explosive ordnance disposal team at Ft. Shafter. From left to right are Lt. John L. Chandler, Cpl. Donald Studer, Sgt. Hachiro Shimaraki, Sgt. 1st Class Walter Hudebenko, Pfc. Richard Belint Jr. and Pfc. Lafayette Bozeman. Team members not in the picture are Herbert T. Baptist and James E. Dilliner. (Army photo.)

EXPLOSIVES HIDDEN IN LANAI CAVE—In the picture at the left, Lt. Kiichi Takahama of the Lanai City police department, and Manuel Pavao of the Hawaiian Pineapple Co., show Lt. John Chandler of the army's dud disposal team where a cave full of explosives was discovered. Above, the men display some of the 600 pounds of TNT brought out of the cave two months ago. The cave is near Kaumalapau harbor. Disposal of this type of menace could be the means of saving lives. (Army photo.)

Hawaii's War Against the Dud

By GORDON MORSE

HAWAII HAS been spared the slaughter that follows every modern war when dud ammunition is left lying around for youngsters to bring home or pound with a hammer.

Following World War II an estimated 10 persons a day throughout the United States from 1945 to 1947 died from exploding dud ammunition. Hawaii has had four deaths since 1946.

The reason for our low death rate is simple: There is a continuous campaign by the army to clear all public areas of duds; we have an alert police force that can handle delicate situations when a dud is found in someone's flower garden; and Hawaii's public is educated to the danger, and report duds immediately.

These reasons, however, did not exist at the beginning. There have been nine years of hard work by the people you will read about in this brief history of Hawaii's war against the dud.

A dud is an unexploded charge that has been fired but, through mechanical fault—the manufacturer's or because of the angle at which the charge hit—it failed to explode. It may never explode. Then, again, the slightest jar may set it off.

There is no limit to the effectiveness of a powder charge. Almost every year stories come out of Europe concerning some farmer who has plowed up a dud that was fired during World War I. Mainland newspapers still carry stories of deaths caused by the explosion of Civil War cannonballs and other ammunition used as far back as the Revolution.

Hawaii was first aroused to the dud danger on July 5, 1946, when one teenager was killed and five others injured on Rabbit Island. A 20 millimeter antiaircraft shell they were fooling with exploded. Until the second death on Oahu early this year, and two more on the Big Island, there have been only minor explosions, with one man being hospitalized on Oct. 8, 1947, when he hit a four-inch shell with a hammer after he found the object on Kam IV Rd.

Prior to the first incident, in 1946, the army, navy and ordnance departments in Hawaii generally cleared military target ranges after extensive periods of target practice.

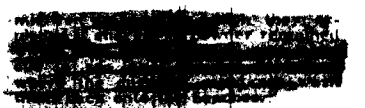
However, it was in 1946 that the territory began to reclaim these military lands. The areas had to have a "clean bill of health" before the public could again use them for fishing, hiking and picnicking.

The dud death on Rabbit Island was the handwriting on the wall emphasizing that the armed forces had to do a complete job.

Samples of the munitions found were the Kahuku airfield, which [illegible] Rabbit Island and all small islands off the coast of Oahu and neighbor islands; Waimea canyon and the Kokee ranges on Kauai, a desert in the Big Island, and numerous gulches and ridges everywhere that were used for training and target practice.

The initial cleanup job fell to a group of about 50 men from the 18th Engineer Corps at Schofield Barracks. They were known as the bomb disposal squad. More than half the crew were local men. Their equipment consisted of bulldozers, trucks, an ambulance, two [illegible] trucks, mine detectors, [illegible] and the ability to crawl through lantana.

DUDS FROM MAKUA VALLEY—Lt. Wilson W. Lee, left, and Sgt. Charles Rone of the USArPac engineer range clearance team, display a small mountain of duds picked up in Oahu's Makua valley after extensive firing problems there by troops in training. These duds came from a search in 1950. One hundred and 300-pound bombs were cleared from that area in 1946. The valley is still being used for air and land target practice and is a good place to stay away from when going on a picnic. (Army photo.)



Three good examples of how the areas were cleared were the jobs done on the tiny treeless island of Molokini, the Waimea canyon on Kauai and Rabbit Island.

Molokini is a crescent-shaped rim of a sunken volcano between Maui and Kahoolawe. Before the war the territory operated a lighthouse on its barren ridge. During the war it was used as a target for dive bombers that approached the high, narrow island as if it were a ship, and dropped 1,000- and 2,000-pound anti-shipping bombs.

The squad was put ashore early one morning with dynamite and fuses. By late afternoon it had unearthed dozens of bombs the size of a single bed. The smaller ones were detonated together with a common fuse. The larger ones were laced together and exploded with a 45-minute fuse.

The crew was taken five miles off the island in a launch to watch the explosion. When it came, it blew the whole top of one side of the island into the sea. Boulders were blown more than a mile from the island and into the sea.

The Waimea canyon project took five months to clean up as the men had to build a road up to the range that was on a plateau 17 miles behind the town of Waimea. The number of duds taken from this area made a mound 20 feet across and five feet high.

On Rabbit Island, as in numerous other areas around Oahu, the disposal team searched the beach with mine detectors which registered metal buried beneath the sand. It took no chances that a shell would be uncovered by high waves in future years to kill some unlucky fisherman. The [illegible] on the [illegible] also scoured the [illegible] floor around the island for duds.

The gulches and firing ranges on Oahu were the hardest to clear. The men scaled steep slopes through lantana and actually dug into the face of red earth cliffs seeking out bazooka and rifle grenades. In Makua valley, Oahu, they found everything from 100-pound aerial bombs to whole cases of machinegun ammunition.

Private property in the middle of a residential district was no exception. On the grounds and in guava bushes surrounding a wartime service club in the coconut grove in Kailua, Oahu, the bomb disposal team found more than 50 hand grenades.

Thorough searching like this is what has spared Hawaii from the numerous deaths that have occurred in other areas. Although the Schofield bomb disposal team was deactivated in 1948, the work has been carried on by other teams on a smaller scale. Today it is handled mainly by a small group of men known as the army Pacific explosive ordnance disposal team at Ft. Shafter and is under the command of Lt. John L. Chandler. These men are on call at all hours.

One recent call was from Lanai where an employe of the Hawaiian Pineapple Co. discovered a cave near Kaumalapau harbor with 12 cases of TNT hidden inside.

Today there are no known actively dangerous public areas on Oahu, or on the neighbor islands, except Kahoolawe, where dud ammunition may be picked up by children. There are dangerous military firing areas, but these are clearly marked and due warning is posted whenever there is to be firing.

But there is always the chance that a previously undetected dud can become exposed due to erosion, be washed up on the beach by high surf. These cases are few and far between, and the police should be notified immediately.

A good practice right now is to hunt up all the World War II souvenirs you have around the house. If you are positive they are not duds, call Ft. Shafter. No one will take away your souvenirs, but the experts will enjoy on the tradition of making a Hawaiian duel and real dud.

DUD AT REST—This 16 mm. shell lies on a firing range high in the mountains above the town of Waimea, Kauai. It has green and yellow markings which characterize it as a high explosive charge. The range was cleared of such duds in 1947 by a Schofield Barracks engineer search team. (Gordon Morse photo.)

HONOLULU ADVERTISER, MAY 10, 1956

K. Shimosaki

AO1 EDWIN APPERSON GM1 LEONARD MEALOR

Fisherman's surprise catch from Ala Moana coral-heads, live bazooka rockets.

Live Rockets Found off Ala Moana

Spearfisherman Tom Beveridge found two rockets beyond the reef off Ala Moana Park—and missed a chance at a giant lua when he led Navy demolition men back to the missiles.

Mr. Beveridge, of Waimanalo, spotted the rockets Tuesday in about eight feet of water. He notified Army disposal men, who had the Navy contact him.

YESTERDAY afternoon, while Honolulu police and several officers of the Navy's Explosion Ordnance Disposal Unit No. 1 waited on shore, Mr. Beveridge guided five flippered and face-masked Navy swimmers out beyond the coral rocks.

They brought back two 3.5-inch bazooka rockets, anti-tank projectiles capable of piercing 11 inches of steel.

Mr. Beveridge brought back frustration. While relocating the rockets, he had been taunted by an ulua about three feet long. And Mr. Beveridge didn't have his spear.

Lt. Cmdr. M. L. Yager of the disposal unit said the rockets were the first found in that area, roughly off the park tennis courts. He wouldn't hazard an opinion as to how they got there.

But one of the swimmers remarked that they looked as if they'd been in the water about the length of time that has passed since last year's Armed Forces Day demonstrations.

THE ROCKETS looked a bit seedy from their submersion, but the Navy experts said they would explode if dropped. They will be taken to Makaha and set off.

A policeman at the scene was asked if the police radio dispatcher had tagged the case a "106." The policeman pondered a minute, said he thought so.

"106" is police code for "Firecrackers, etc."

HONOLULU STAR-BULLETIN, August 23, 1956

Navy explosive disposal men blow a mine off Oahu

Navy's Bomb Disposal Unit Can Afford NO Mistakes

By MARK WATERS

No living member of the Navy's Explosive Ordnance Disposal unit at West Loch Naval Ammunition Depot has ever had a close call.

That's why they're living.

"One mistake and you're dead," Lieutenant Preston Harrison says.

"And fortunately the local group has never had a casualty."

He's assistant in charge of E.O.D. here, an elite corps of highly trained specialists who dispose of bombs, shells and other unexploded ordnance found in places they shouldn't be.

The West Loch group is one of two such Navy disposal units.

IN PACIFIC AREA

It disposes of dangerous explosives in the Pacific area.

Another group in Charleston, South Carolina, does the same in the Atlantic area.

There are 15 officers and 40 men in each unit and they all receive eight months of schooling at Indianhead, Maryland, in their speciality.

And each one is highly trained for all types of underwater diving, from deep sea with full equipment to shallow water skin diving.

The officers get $110 a month extra and the enlisted men $55 for their hazardous occupation.

LITTLE DISARMING

"Despite what the general public thinks," Harrison said, "we do little disarming of exposives.

"We dispose of most by either blowing them up on the spot or moving them to a place where we can.

"It's hazardous enough putting an explosive charge on a bomb without trying to tinker with its innards.

"However, we can and do disarm any explosive made if called upon to do so. That's what we've been trained to do."

He said his unit disposes of about 15 explosive objects a month in the Territory.

One thing Harrison wanted made clear.

"We are not frogmen and we are not members of the Underwater Demolition Team groups," he said.

Above everything else, his men stress safety.

"You aren't allowed a second chance in explosive disposal work," he said.

"One mistake and you've had it."

HONOLULU STAR-BULLETIN
Thursday, November 8, 1956
p. 42:1

[redacted]

World War II is long since ended, but you can still become a casualty of that conflict—and without half trying [redacted] years from now, they may still be coming.

Calling cards of the Korean conflict may ride in on a wave someday, too - Russian mines sown by the North Koreans. None have reached the Islands yet, but in Japan they have accounted for a number of innocent victims.

[redacted] of mines before they can deliver their overdue punches is the assignment of [redacted]

[redacted]

The unit goes into action when local police and other government agencies report suspected mines.

Sometimes the reported mine isn't a mine at all. But the unit prefers kids to corpses.

Mines aren't the only menace.

[redacted] hand grenade discovered on a resident's property, and a six-inch projectile on Poipu Beach, Kauai.

Honolulu Star-Bulletin
Tuesday, January 15, 1957

Demolition Team Removes Device

A mine scare shut down Honolulu Harbor for more than two hours this morning until a demolition team removed the mine, a type used in training exercises.

It carried no dynamite charge but might have a small detonating charge, the Coast Guard reported.

The harbor was closed from the time a regular harbor patrol discovered the mine near the harbor entrance at 9 a.m. until the demolition men towed it to Sand Island at 11:10 a.m.

TOWED TO PIER

Two frogmen from Explosive Ordnance Demolition Unit Number One of the West Loch Naval Ammunition Depot, and a Honolulu policeman got to the mine shortly before 11 a.m. and towed it to the Coast Guard Pier on Sand Island.

They found the mine unloaded.

The marking "Inert Drill Mine" was painted on the eight-foot long, 2½-foot in diameter mine.

The frogmen said that if it had been a real mine they would have attempted to disarm it in the channel where they found it.

One of the men from the demolition unit said the mine would have contained 1,100 pounds of explosives if it had been armed.

He didn't know where the mine came from but said it may have broken its moorings and floated into the harbor from a training area.

The mine will be taken back to West Loch, he said.

Lieutenant, Junior, Grade James E. Clayton and Chief Gunner's Mate John Dellagiacoma left Pier 1 with Police Patrolman Richard Dung in frogmen's outfits to scout the objects.

After inspecting the object, they snagged it with a line and towed it toward the San Island Coast Guard pier.

It was first found near the reef along Sand Island opposite the harbor entrance, but the receding current had taken it into the entrance soon after its discovery.

SHIP DELAYS SAILING

The first ship affected by the harbor

HONOLULU STAR-BULLETIN, August 19, 1963, p. A1:2

Divers Salvage Ancient Cannon

Three Honolulans diving for fish off Honolulu Harbor August 10 discovered an old cannon they think may have come from a Russian ship.

The cannon is believed to be more than 100 years old.

The men — Lee Sievers, Jay Sherlock and Frank De Luna — said they were diving about a hundred yards in a Diamond Head direction from the channel entrance when Lee saw the cannon in 35 feet of water.

They tried to raise it then but couldn't and waited a week before bringing it ashore Saturday morning at Fishermen's Wharf.

Sherlock, a crew member aboard the Neptune, U. University of Hawaii research ship, and De Luna, a research assistant in the university's civil engineering department, said the cannon weighs about 600 pounds.

It is encrusted with coral and marine growth.

The 22-foot sampan "Linda," owned by Sievers, towed it in to the pier.

"We've had a couple of offers for the cannon," De Luna said, "but we're not sure what we'll do with it."

Wayne Davis, 13, of 251 South Vineyard Street, inspects an old cannon found at the bottom of the ocean near the entrance to Honolulu Harbor.—Star-Bulletin Photo by John Titchen.

HONOLULU STAR-BULLETIN, November 7, 1965

EODU Men Dive Deep To Defuse Explosives

(Editor's Note: EODU-1, the only Navy explosive ordnance disposal unit in the Pacific, took to the sea yesterday to practice its trade underwater. Advertiser staffer Bob Jones donned scuba gear and went down too, to get this story.)

By BOB JONES
Advertiser Military Editor

Time: 11:53 a.m. Place: A mile off Pearl Harbor, where the ocean swells are whipped up by the winds that blow off Diamond Head.

Lt. Sam (Mr. Sam) Henderson and Machinist's Mate 1-1C Tom Peeling had been sitting on the rolling 50-foot boat and breathing their special helium-oxygen mixture for a minute to get their bodies used to the strange gas.

Henderson gave the high sign, and the West Loch Explosive Ordnance Disposal Unit team slid into the water.

Peeling was carrying a hand-held sonar that reaches out 1,000 yards with its high-pitched ping to detect mines, bombs and torpedoes.

Earlier, we'd dropped a 1,000 pound practice mine to the bottom, and Peeling was zeroing in on it.

Four of us edged down through the water, which was rich with large chunks of plankton. Besides myself and the two EOD men, there was a Navy underwater photographer.

The underwater breathing gear Henderson and Peeling were wearing didn't look like anything most scuba divers have seen. It's the Mark-6 mixed gas rig.

Breathing bags on the chest keep a constant flow of gas to the diver. His exhausted breath goes into a cylinder of barium hydroxyline, where the carbon dioxide is filtered out, and the rest returned to be breathed again.

It's an experimental rig, and with it Navy divers hope to go deeper and work longer than they ever have before. The tanks have a mixture of 68 per cent helium and 32 per cent oxygen.

(Normal air has 21 per cent oxygen, 78 per cent nitrogen, and one per cent inert gases.)

Nitrogen is the diver's enemy underwater, and with this new mixture, decompression time after a dive is cut considerably.

Fifty feet down, where the visibility was restricted, the mine lay on the ocean floor.

When Peeling found it, he handled his sonar to Henderson and began the task of approaching it as if it were live.

Mines can be set off many ways. Impact is just one. Noise, magnetism, or just the movement of water around it are others.

Peeling purged the air from his breathing bags so there would be no noise of escaping bubbles as he came up on the mine. His underwater rig is completely non-magnetic.

Fifteen minutes later, the task was completed, and we came slowly to the surface, letting the air expand carefully in our lungs.

West Loch's EOD unit doesn't get much publicity—and that's the way the Navy usually likes it because much of their work is classified.

"These divers can handle any explosive ordnance from a Civil War cannonball to nuclear weapons," said Lt. Cmdr. Charles K. Naylor, skipper of the 50-man outfit.

The Navy disclosed for the first time this week that West Loch's EOD men have been going to Viet Nam for some time. Their work and location are classified.

The men get tapped for all manner of jobs. They removed the target simulator which, accidentally, was fired ashore at the Hilton Hawaiian Village last year.

They blast channels from the coral, and defuse old World War II bombs that people sometimes find in the ocean.

Peeling was one of the divers who had to probe in the murky harbor waters of Pearl Harbor Naval Station earlier this year and bring in the body of a sailor who fell in and drowned one night.

Naylor was part of a team which swam under the destroyer Frank Knox when it was aground in the South China Sea. (Someone hadn't properly checked his tank, he ran out of air, and had a close call.)

If you want to turn an EOD man's normally smiling face to livid rage, call him a "frogman" or UDT man.

He isn't either. His job is to know how to defuse every kind of weapon in the arsenals of the U.S. and other countries.

Much of the work is underwater, of course, since the unit comes under Mine Force Pacific headquarters. But when planes from the carrier Kitty Hawk accidentally bombed Niihau last month, Naylor's men had to go over the landscape to make sure all the bombs had exploded.

Each man gets six months of explosive ordnance disposal school at Indianhead, Md., and 10 weeks diving school. Every three years he goes back for a 10-week refresher course on the latest weapons he might encounter.

Every six months he must make two dives to 120 feet, two 500-yard swims and two 30-minute working dives to 30 feet. Most EODU-1 men log ten times that in actual practice.

In bad weather it's a difficult job that requires a little extra attention to safety. (Safety is stressed to the point where skipper Naylor believes some restriction should be placed on selling scuba gear to divers who haven't been through an accredited school.)

But sometimes it has little extras.

Lt. (jg) Mick Heinz was working on the practice mine yesterday when he was "attacked" by a lobster. He defended himself by bringing a near 3-pounder to the surface.

Likely, it ended up on his dinner table last night.

HONOLULU STAR-BULLETIN, Monday, May 23, 1966, p. A9

Undersea explosion slated tomorrow

WASHINGTON (AP)—The Navy plans to detonate 800 to 1,000 tons of obsolete explosives 4,000 feet deep in the Pacific tomorrow in a resumption of its underwater seismic research program, the Defense Department has announced.

The explosion will be a continuation of underwater tests conducted by the Navy in the Atlantic last year to improve methods for detecting underground and underwater detonations.

Tomorrow's test will be fired 75 miles off Cape Mendocino, California, using old mines, torpedo warheads and other obsolete conventional ordnance.

The explosives will be sunk in the hull of an old World War II Liberty ship, the S.S. Isaac Van Zandt, which will be towed from the Bangor, Washington, Naval Ammunition Depot and scuttled.

Seismic stations around the world will be alerted to monitor the blast, the first to be detonated off the West Coast.

The Pentagon said the explosion will cause no noticeable effect on adjacent coastal areas. Little surface disturbance is expected but safety patrols will be on hand to prevent ships or boats from intruding near the test site.

The Navy previously has disposed of obsolete ammunition by jettisoning it into the sea. Now the explosives are being put to use in what are called the Vella Uniform seismic experiments.

The Pentagon said another test will be conducted off the East Coast this summer. The location has not been chosen.

HONOLULU STAR-BULLETIN,
August 22, 1966

Bomb blown up at Makua Beach

A 500-pound Navy depth bomb was found floating in 15 feet of water at Makua Beach yesterday morning.

About 1,000 bathers had to be cleared from the area near Farrington Highway.

The Navy said it was of World War II vintage and had been in the water 20 years or so.

A Navy spokesman said it was a Mark 37. At first the Navy said it was a newer antisubmarine warfare type that may have been accidentally dropped by a Navy plane.

A Navy bomb disposal team from Barber's Point was called to the scene and detonated it at 12:50 p.m., sending a geyser 300 feet into the air.

Witnesses said the water appeared to boil after the bomb was exploded about 150 feet off shore.

The bomb was discovered by Wallace P. Yeager of Nanakuli at 7 a.m. while he was setting nets. He notified police and the Navy team was called to the scene.

HONOLULU STAR-BULLETIN, April 21, 1970, C20-1

LIVE BOMB—Navy men inspect an unexploded bomb on tiny Mokuhoonniki Island east of Molokai. The island was used as a bombing target. Fish and Game Division Photo

Navy to Detonate Bombs on Tiny Island Tomorrow

By Helen Altonn
Star-Bulletin Writer

Ten unexploded bombs on tiny Mokuhoonniki Island east of Molokai will be detonated by the Navy tomorrow.

No danger is expected to the birds which populate the island as they are away at sea fishing.

However, the adults will return soon to the island at night to burrow holes in the grounds for their nests. They lay their eggs in June.

THE ISLAND, about 203 feet high and 100 to 150 yards wide, was used as a Navy bombing target from July 1, 1944, to January 1958.

Now it's a wildlife reserve—occupied by the wedge-tailed shearwater—under the jurisdiction of the State Department of Land and Natural Resources.

David Woodside, with the Wildlife Branch of the department's Division of Fish and Game, discovered the live bombs while checking the bird refuge last October.

HE SAID the public is barred from the island and it is seldom visited.

But the Navy was asked to dispose of the bombs to avert a possible accident.

Woodside returned to Mokuhoonniki with a Navy plane in November to survey the situation. The men were lowered to the island from the plane.

A TEAM of experts from the ammunition depot at West Loch will detonate the bombs.

People are warned not to boat, swim or wade in the vicinity tomorrow. Fish and game wardens will be present to keep fishermen out of the danger zone.

THIS DAY IN OUR HAWAIIAN HERITAGE

By Russ and Peg Apple

April 21

1883: Fourteen years after the founding of the Young Men's Christian Association in Honolulu, a YMCA building was constructed and dedicated, and the keys to the building were presented to A. Francis Judd.

The inviting structure was situated on a 100x116-foot lot between Alakea and Hotel streets. The grounds had been purchased for $4,000, a little over 34 cents per square foot.

Four Corinthian columns supported the second-story balcony. A wide central porch marked the entrance.

On this day in 1883 at the 14th annual meeting of the association, the building was dedicated. Theophilus H. Davies was the main speaker, S. C. Damon offered a prayer, Mrs. B. F. Dillingham read a poem written for the occasion and the best choir in the city provided background music and appropriate selections. King Kalakaua was the honored guest.

For 56 years the YMCA occupied this building. In later years it also housed the Young Women's Christian Association activities.

In 1927 the structure was torn down and the area was converted to a parking lot.

HONOLULU STAR-BULLETIN, September 15, 1970, p. A1-4

Radioactive Waste in Pearl Harbor

By Frank Hewlett
Star-Bulletin Correspondent

WASHINGTON — The Navy has dumped more than 3½ million gallons of radioactive liquid waste into Pearl Harbor in the last four years, and now plans to increase the amount of discharge.

This was disclosed today by Rep. Patsy T. Mink, who told the Star-Bulletin she is "deeply concerned" and has asked for an investigation by the Federal Council on Environmental Quality, headed by Russell E. Train.

(Pearl Harbor officials today declined comment on Mrs. Mink's complaint. The Navy's position is that the waste is not harmful. This view was stated years ago when officials first announced that radioactive waste was being dumped in the harbor.)

Mrs. Mink said the waste originates in pressurized water reactors of the Navy's nuclear ships, which are overhauled and repaired at the Pearl Harbor Naval Shipyard. The amount of discharge increased from 654,000 gallons in 1966 to 1,279,000 gallons in 1969, she said.

IN A LETTER to Train, Mrs. Mink said, "I am deeply concerned over the long-range environmental danger posed by this discharge.

"The Navy is presently expanding its capacity to treat such waste, and presumably the volume discharged will subsequently increase to levels even higher than those of past years," Mrs. Mink wrote.

"While some study has been devoted to the environmental effects of this discharge, it was conducted by agencies concerned with the promotion of nuclear energy and nuclear naval vessels.

"I would appreciate your investigation of this matter to assure complete protection of the environment and the health of our people."

MRS. MINK also made public an 11-page report from the Navy which disclosed it is planning to spend $219,000 to expand its capacity for treating radioactive wastes at Pearl Harbor. The Navy said the treatment eliminates the possibility of contamination or pollution of harbor waters.

Mrs. Mink pointed out that as of last year, Navy data showed radioactive cobalt was detected over a portion of the bottom of Pearl Harbor which she said was the second largest such area of any Navy shipyard.

"Moreover, samples showing cobalt were taken from

Turn to Page A-18, Col. 3

HONOLULU STAR-BULLETIN, September 15, 1970

Navy Dumps 'Hot' Waste in Pearl Harbor

Continued from Page 1

the surface layer of the bottom," Mrs. Mink said. "The Navy said cobalt levels a foot deep may be two to five times greater."

The report received by Mrs. Mink was prepared by J. J. Manfeno and M. E. Miles of the Nuclear Power Directorate, Naval Ships Systems Command, Department of the Navy. The report was approved by Adm. H. G. Rickover, the Navy's deputy commander for nuclear propulsion.

THE NAVY'S report said over-all results of environmental surveys performed in 1969 indicate the following:

"1. No increase in radioactivity above normal background levels has been detected in harbor water where U.S. naval nuclear-powered ships are based, overhauled or constructed.

"2. Discharge of liquid wastes from U.S. naval nuclear-powered ships have not caused a measurable increase in the general background radioactivity of the environment.

"3. Low-level cobalt 60 radioactivity in harbor bottom sediment is detectable around a few piers at operating bases and shipyards where nuclear-powered ship maintenance and overhauls have been conducted over a period of several years. Cobalt 60 is not detectable above background levels in general harbor bottom areas away from these piers. Maximum total radioactivity observed in a U.S. harbor is less than one curie of cobalt 60."

HONOLULU ADVERTISER, April 1, 1972

big Pearl Harbor cleanup under way

Starting Monday, the Navy will launch a 12- to 18-month cleanup campaign to clear Pearl Harbor of debris, litter and wreckage—some of it dating back to the Japanese attack more than 30 years ago.

The Navy said the cleanup has continued ever since WW II to the extent that priorities, manpower and funds are allowed. But this is the first time a unit has been specifically assigned the task, a spokesman said.

HARBOR Clearance Unit I, commanded by Lt. Cmdr. Thomas L. Swift, has been equipped with a specially constructed "ecology barge." The barge has an A-frame and winch to raise submerged wreckage or debris.

A 14th Naval District spokesman said the project ties in with the Navy's long-range program to free Pearl Harbor of all pollution and to preserve the natural beauty of the environment.

Swift's mission is to rid the harbor of abandoned piers, wharves and piles; sunken and beached ships, barges, small craft and shoreline debris, and surplus buildings and litter at the shoreline.

ONLY TWO sunken ships will be allowed to remain—the USS Utah and the USS Arizona.

The cleanup is scheduled to begin in Middle Loch. The barge then will move to West Loch.

West Loch is expected to prove difficult because of the large number of rusting hulks and dilapidated piers there and because of the occasional appearance of sharks in the waters.

HONOLULU ADVERTISER, May 10, 1973, A1:5

1941 Japanese bomb recovered

Navy divers yesterday recovered a 1941-vintage, Japanese-made bomb from the ocean floor in Kaiaka Bay about 1,000 feet off Waialua.

Lt. (j.g.) Steve P. Epperson, explosive ordnance officer who headed the diving team, said that the 200-pound bomb would not be identified until veterans at the Navy ammunition-storage facility at West Loch look at it.

The bomb, apparently dropped in the Japanese attack on Pearl Harbor on Dec. 7, 1941, was discovered Sunday by scuba diver David W. Francis. Francis is a submariner stationed at Pearl Harbor.

The bomb will be disposed of in an Army disposal area, Epperson said.

Epperson said that Wahiawa police had requested that a naval diving team check out the bomb report.

The three-man Navy team was led to the area by Francis. After a 25-minute search, they found the bomb in 70 feet of water, lodged in coral.

The team needed to break away the coral growth before attaching floats to the device to raise it to the surface.

Epperson, who has been diving for unexploded ammunition for more than three years, said that this was the first bomb of its kind found near Oahu "in many years."

He said his team receives about one call a week to look for reported explosive devices but noted, "We've never found one of these before. Usually we find oxygen bottles and the like. But we always look."

Advertiser Photo by Art Otremba

A Navy ordnance expert handles the bomb gingerly.

Bomb found at Pearl

A very large and apparently old bomb was discovered yesterday on Ford Island by construction workers, according to Navy spokesmen.

Workers for the Las Vegas firm of Maitland Brothers were digging a trench for a sewage pipe when they came across a projectile buried about 5 feet down and about 75 feet from the shoreline.

The projectile, found encrusted and showing signs of age, was described by being 12 inches across and 42 inches long.

A Navy ordnance disposal team and some of the workers removed the bomb from its resting site on the Diamond Head side of Ford Island near Fox-I Pier.

The Navy said the bomb was taken to an undisclosed location on the island for the night and will be studied this morning by experts, who will try to determine its origin and ways to dispose of it.

Officials last night were considering the possibility that the projectile may date back to the Pearl Harbor attack in 1941, but they could not decide if it is from the big guns of the defending American ships or from the attacking Jap. planes that carried 12- to 16-inch bombs.

HONOLULU STAR-BULLETIN,
June 9, 1977

A DUMMY—Jack Huffey of the Navy's Explosive Ordnance Disposal Unit inspects a 2,000-pound bomb which was removed from a construction site yesterday afternoon. The World War II bomb, filled with sand, apparently was used for practice purposes. —Star-Bulletin Photo by Craig T. Kojima.

Construction Workers Find a Dummy Bomb

By Joy Hartwell
Star-Bulletin Writer

The fear was real; luckily the bomb was not.

A 2,000-pound, World War II bomb discovered yesterday morning at a construction site near Pearl Harbor brought some excitement into the lives of the construction workers who found it, the Navy bomb squad who moved it and Honolulu policemen who escorted what turned out to be an inert practice bomb filled with sand.

Discovered at 9:30 a.m., the bomb was not moved until 6 p.m. when a nearby school closed for the day. The bomb disposal squad took the bomb to the Army's Makua Range near Makaha under police escort.

AT MAKUA, THE squad attached an explosive charge to the bomb.

"They fired a shot charge into it and withdrew a sample, and it turned out to be sand," Richard Rothrock, a Navy spokesman, said.

The bomb was apparently a Type-M service bomb used in training for the Army Air Forces during World War II.

The construction site, owned by Queen's Hospital and being developed into an industrial park, was formerly a cane field which was in the flight path of the airstrip at Hickam Air Force Base.

Navy officials speculated that the bomb may have been dropped from a disabled plane which flew over the canefield while coming in to land at Hickam.

Honolulu Star-Bulletin
June 19, 1982

In Waters Off Park Near Kahuku

More Old Bombs Detonated

By Harold Morse
Star-Bulletin Writer

Navy men blew up six or eight more World War II bombs yesterday in waters off Malaekahana State Recreation Area near Kahuku as news cameras recorded the geyser-like displays including some double blasts.

The Navy set out to explode a total of 11 bombs yesterday, but not all went off. Of four other bombs found there last week, three were detonated on June 10 and one was found to be a practice bomb.

The Navy continued checking the area after yesterday's explosions and warned divers and swimmers to report but not to touch bombs they may spot in the area.

Meanwhile, Kent Warshauer, a man who says he is writing a book about the impact of military ordnance here in World War II, shed light on how the bombs got there.

Small islands offshore from Malaekahana were used for target practice during and after World War II, Warshauer said. He referred to a 1945 newspaper story as evidence which was verified by a check of newspaper microfilm files.

Lt. Cmdr. Heinz Mauer, commander of Explosive Ordnance Disposal Mobile Unit 1, said after yesterday's detonations, there seemed to have been six high-order explosions, one possible "low-order" and at least two bombs that did not explode.

"THERE WERE 11 items," Mauer said, adding that nine separate timed charges were rigged up to detonate the bombs. Because some bombs were close together, some were rigged to explode simultaneously, he and other Navy officers pointed out.

His men were going back out, about 1,200 yards offshore near a small island, to set new charges on two 500-pound bombs that didn't explode and to reset a charge on the possible "low-order" bomb, Mauer said.

At the scene, Lt. Cmdr. Terry Briggs, executive officer of the mobile unit, said two of the bombs appeared empty, with holes rusted in them.

"You could see sea urchins in one," he said.

The newspaper article Warshauer referred to appeared in The Honolulu Advertiser Sunday, Sept. 9, 1945, headlined "Islands off Oahu Still Being Used as Bomb Targets."

It had a dateline, "HEADQUARTERS ARMY AIR FORCES, MIDDLE PACIFIC, Hickam Field."

THE STORY said:

"Maj. Gen. James E. Parker, commanding general, of Army Air Forces, Middle Pacific, warns all military personnel and civilians that, despite the end of the war, the group of small islands between Kahuku and Laie, Oahu, are still in use as bombing and gunnery targets.

"Until further notice no persons, under any circumstances, will be permitted to go ashore on any of these islands, according to Gen. Parker.

"He pointed out that since VJ Day many swimmers had visited the islands and in doing so had greatly endangered their lives. The area is subject to bombing and gunnery action at all times and without notice and disciplinary action will be taken against all violators, the general said.

"THE ISLANDS are located between Makahoa and Laniloa points."

Laniloa Point is also known as Laie Point.

The state Department of Land and Natural Resources gave the Navy permission to explode the bombs found recently.

One exploded yesterday was said to be a 750-pound bomb. Nine more of the 11 bombs set for demolition yesterday were 500-pounders, and one was a 250-pound bomb, the Navy said.

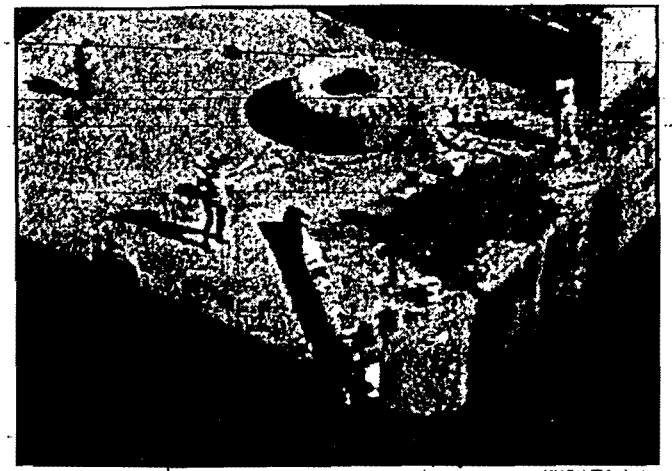
Swimmers, surfers and divers were kept out of these waters yesterday.

Lt. Cmdr. Briggs did not think it would be dangerous to enter the waters this weekend. But he advised swimmers not to touch any suspected bombs they might find, only to note the location as closely as possible and notify authorities.

The round of bomb discoveries began with a civilian diver finding one earlier this month near the offshore island. He notified authorities, and additional bombs were found upon investigation.

HONOLULU ADVERTISER, May 3, 1991

Pearl Harbor yields WWII torpedo



KHON-TV photo

The torpedo sits on this barge, awaiting a trip to sea, where it will be blown up with explosives.

By Thomas Kaser
Advertiser Staff Writer

A Japanese aerial torpedo that was probably dropped during the Pearl Harbor attack nearly 50 years ago was dredged up near Ford Island yesterday morning by a private contractor doing work for the Navy.

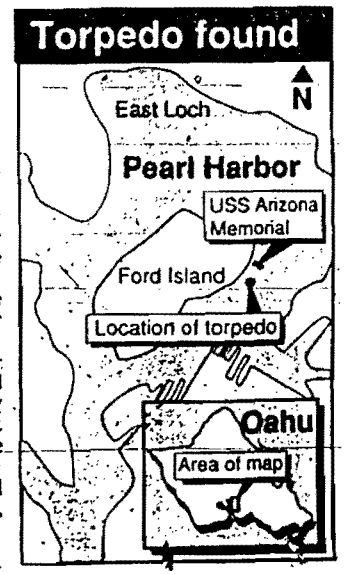
The torpedo, containing about 600 pounds of high explosive, appeared in a scoopful of muck that had been brought up a few hundred yards makai of the USS Arizona Memorial, near where two other ships — the Oklahoma and the Maryland — were moored side-by-side the morning of the Dec. 7, 1941, attack.

The Oklahoma, which was outboard, capsized. The Maryland, which was inboard, did not receive major damage.

After the torpedo was discovered at about 9 a.m. yesterday, the harbor was closed to outside tour boats, and naval ordnance experts were called to the site. They determined the torpedo has deteriorated so much that any attempt to disarm it and keep it for historic value would not be practical.

The torpedo was on a barge in a remote part of Pearl Harbor last night and will eventually be taken to sea.

See Torpedo, Page A4



Torpedo: Pearl Harbor yields WWII relic

FROM PAGE ONE

rigged with explosives and blown up, said Cmdr. Joel Keefer, public affairs officer for Pearl Harbor.

"In the meantime, we're treating it as live ordnance. Old explosives tend to be very unstable," Keefer added.

He said it has been "a long time" since an explosive remnant of the Pearl Harbor attack has been found.

Keefer said there is no way of determining whether the torpedo was meant for the Oklahoma or the Maryland.

Of all the ships sunk at Pearl Harbor, the Oklahoma was the most difficult to salvage. Because it had capsized, it could not be refloated until it was rolled over with an elaborate system of winches and cables.

After it was raised in 1943, it was determined to be useless and sold for scrap. It sank while being towed to the Mainland in 1947.

Big Mo arrives today: The torpedo is not expected to affect the arrival at Pearl Harbor at noon today of the 887-foot battleship USS Missouri, for a brief stopover after a six-month deployment in the Persian Gulf.

The Iowa-class battleship, with its crew of more than 1,600, will leave Monday for its home port of Long Beach, Calif.

The public is invited to visit the ship tomorrow from noon to 4 p.m. Visitors should park their cars in the Naval Base Pass and I.D. parking lot, just outside the Nimitz Gate.

The Navy will provide transportation to, and group tours on, the ship at Pearl Harbor's Bravo Pier. Children must be at least 8 years old to attend.

World War II ended when Japan surrendered aboard the "Big Mo" in 1945.

Inouye: Kahoolawe faces hurdles

KAHULUI, Maui — Any recommendation that Kahoolawe be returned to the state with all hazardous ordnance removed will meet resistance in Congress, U.S. Sen. Daniel Inouye said yesterday.

In a press briefing on Maui, Inouye said there are two major issues before the Kahoolawe Island Conveyance Commission, which is holding hearings throughout the state this month.

One issue is over future military access to the "target island." The other is the requirement that, when Kahoolawe is returned to the state, it must be restored to a "habitable condition."

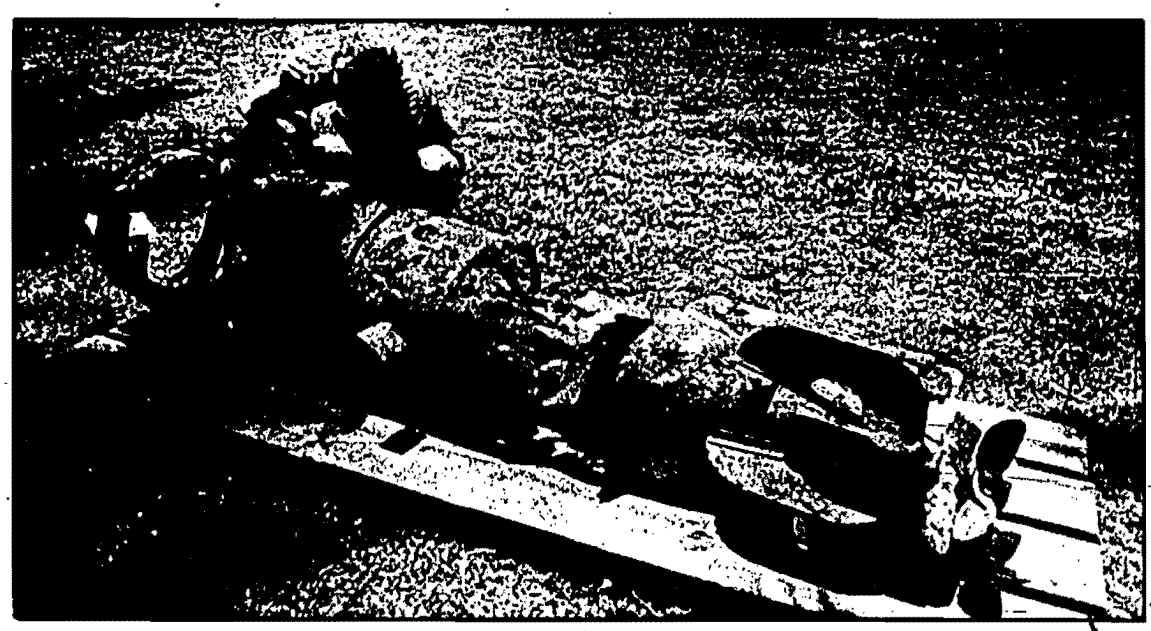
"I don't think the commission will absolutely close its eyes to the needs of the military," Inouye said on the first point.

The second, he said, hinges on the definition of "habitable." If it means just restoring the island for vegetation, it may not be a problem. But if it means restoring the island for people to live safely on it, he said, the cost of clearing all ordnance may be prohibitive.

"If it's deemed to mean full clearing, we're going to find the national government of the United States resisting this," he said. "I don't think the Congress will appropriate $1 billion to clear the island."

On another matter, Inouye said extending the main runway at Kahului Airport to 8,500 feet could lead to international flights.

Honolulu Advertiser, May 23, 1991



A torpedo's tale — in time for 50th

Jim Adams, an archaeology graduate student and Park Service volunteer, examines the remains of a torpedo that was dropped into Pearl Harbor by a Japanese warplane on Dec. 7, 1941. The torpedo was recently found in the harbor bottom. The warhead was detonated. What's left is the back half of the projectile, which was shown publicly yesterday at the Arizona Memorial Visitor Center. The torpedo will be displayed there for the 50th anniversary observance of the Pearl Harbor attack.

Advertiser photo by Carl Viti

Navy cleaning up waste sites

Pays its own way; follows EPA guidelines

By Jon Yoshishige
Advertiser Staff Writer

The U.S. Department of Defense will still pay to assess and clean up potential hazardous waste sites on Navy land in Hawaii despite the recent announcement that Pearl Harbor was added to the Environmental Protection Agency's Superfund list, Navy and EPA officials said.

Superfund is another name for the Comprehensive Environmental Response, Compensation and Liability Act enacted by Congress in 1980. It was the first federal law established to deal with the dangers posed by the nation's hazardous waste sites with an initial appropriation of $1.6 billion.

"Unless there is a special appropriation, Superfund itself is not used to pay for remedial action at federal facilities," said Michael Hingerty, EPA's assistant regional counsel in San Francisco.

But that doesn't mean the 30 sites within the naval complex initially identified as potential sources of hazardous waste will not be cleaned up under the EPA's stringent guidelines.

Since 1980, the Navy has used its own program to identify, assess and clean up or control contamination from past hazardous waste disposal operations and spills at Navy and Marine Corps activities, said Lt. Cmdr. John Singley, spokesman for Pearl Harbor Naval Base.

Some of the problem sites identified by the Navy include unlined landfills, pesticide disposal pits, PCB disposal areas, waste oil facilities and leaking underground solvent tanks, the EPA said.

The state Department of Health said none of the hazardous materials pose an immediate health threat or threaten drinking water sources.

The groundwater around Pearl Harbor is brackish and not suitable for drinking, Navy officials said.

Furthermore, the Health Department is not aware of any chemical contamination problems associated with fish or shellfish from Pearl Harbor, said Bruce Anderson, the department's deputy director for environmental health.

The Navy and EPA cleanup programs have their own source of funds appropriated by Congress. The Navy said it uses Defense Department funds from its Defense Environmental Restoration Account.

"But in many other respects, (contaminated sites under each program) are treated in much the same way," Hingerty said.

When Superfund was reauthorized and amended in 1986, Congress allowed the EPA to include federal facilities on its list — the National Priorities List — without actually having to pay for their cleanup, he said.

The primary benefit to the state — which asked the EPA to include Pearl Harbor on its list — is having a say in the cleanup without having to share cleanup costs, said Health Department spokeswoman Jennifer Castleberry.

Yokota

Being on the list "assures the cleanup is done according to Superfund requirements and that the agencies involved have an opportunity to review and approve cleanup plans," Anderson said.

The EPA will enter a three-way agreement with the federal department responsible for the site — in this case the Navy — and the state, and then provide "appropriate environmental oversight," Hingerty said.

That allows more communication between agencies throughout the investigation and cleanup phases, and lessens the likelihood the EPA will step in later and order the Navy to start over, said Clyde Yokota, the Navy's regional environmental program manager.

The EPA's administrator ultimately would be responsible for resolving any conflict over the appropriate course of action in cleaning up a contaminated site, Hingerty said.

The Navy's plan — called the Installation Restoration Program — focuses on contamination from past hazardous waste operations and spills.

The nature and extent of Navy operations has involved toxic and hazardous material for decades, including seemingly harmless substances like motor oil, gasoline and dry-cleaning solvent.

These materials, if released into the environment, could lead to significant damage of important natural resources that people and nature depend on.

The Navy's plan mirrors the EPA's in many ways, Singley said.

For example, the Navy must conduct investigation/feasibility studies within six months, but those are already under way at most of the Pearl Harbor sites, he said.

One site the Navy identified as possibly contaminated — and under consideration by the EPA — is an old underground fuel storage lot makai of Farrington Highway between Leeward Community College and Waipahu High School's athletic field.

On March 12, 1971, vandals released 315,000 gallons of gasoline onto the ground, resulting in a pool 1- to 2-feet deep and 150 feet in diameter, the Navy said.

About 10 to 15 percent of the gas was initially recovered, but the rest evaporated or percolated into the ground and the underlying groundwater table.

The Navy was able to recover about half the spill with recovery wells and a 600-foot trench to intercept gas floating on the water table.

Since then, the two storage tanks have been emptied of gas and abandoned, and further tests of fuel contamination have been conducted.

HONOLULU ADVERTISER
February 11, 1993

'Torpedo' a current-sensing device

A torpedo-shaped device that washed up on Kaaawa Beach Tuesday has been identified as ocean-current-sensing equipment, said Lt. Cmdr. John Singley, a public affairs officer at the Pearl Harbor Naval Base.

Singley said yesterday that Navy explosive disposal experts opened the device and found electrical optical equipment inside.

With the help of oceanography Prof. Roger Lukas of the University of Hawaii-Manoa, they determined it was used for sensing ocean currents, he said.

Singley said it's unknown where the device came from, but it appeared to have been in the water for quite some time.

Navy explosives experts hauled the device away from the beach Tuesday.

Waste Is Not a Hazard

The Navy denied yesterday that there is a health danger from the discharge of radioactive liquid waste into Pearl Harbor.

Rep. Patsy T. Mink said in Washington earlier this week she is "deeply concerned" about the increase in the volume of the waste dumped by the Navy.

The presence of radioactive deposits around piers at Pearl Harbor was revealed by a congressional committee on atomic energy and reported in the Star-Bulletin in March, 1968.

The radioactivity is not sufficient to create a health hazard, the report said.

But Mrs. Mink pointed out that the discharge of radioactive wastes has doubled between 1966 and 1969, and that there are plans to increase this type of discharge from nuclear reactors.

Pearl Harbor officials, when asked for comment, obtained a statement from Navy officials in Washington. It said:

"The Navy's continuing surveys and studies on this matter conclude there is no health hazard as a result of radiological discharges into Pearl Harbor.

"Quoting from the Navy report which was discussed in recent Honolulu newspaper articles, 'Procedures used by the Navy to control radioactivity from U.S. Naval nuclear-powered ships and their support facilities are effective in protecting the health and safety of the general public.'"

"Navy authorities in Washington have been in touch and are continuing their contact with interested government agencies concerned with this general subject."

INTERVIEWS

U.S. Military Agencies Contacted for Historical Information:

1.

Command:	United States Navy Pacific Fleet
Title:	Explosive Ordnance Disposal / Mine Warfare
Name of Person Contacted:	LCDR Gary Rossi, USN.
Contact Method:	Telephone inquiry with follow-up calls.
Questioned Concerning:	Availability of historical ordnance records, particularly concerning 1940 - 1975.
Results:	No records were available. Received sections of LCDR Rossi's thesis regarding ammunition disposal techniques.

2.

Command:	United States Navy Pacific Fleet
Title:	Public Affairs Officer
Name of Person Contacted:	LCDR Betsy Bird, USN.
Contact Method:	Two telephone inquiries.
Questioned Concerning:	Availability of historical ordnance records, particularly concerning 1940 - 1975. Recommendations of other commands to contact.
Results:	Looked through base Public Affairs Office files. Referred to Explosive Ordnance Disposal Detachment, Pearl Harbor.

3.

Command:	United States Navy Explosive Ordnance Disposal Detachment, Pearl Harbor
Title:	Officer-in-Charge
Name of Person Contacted:	LT David Donovan, USN.
Contact Method:	Referral by both LCDR Rossi (CINCPACFLT) and LT Nahoopii (OIC Kahoolawe) leading to multiple phone conversations.
Questioned Concerning:	Availability of historical ordnance disposal records, particularly concerning 1940 - 1975.
Results:	The Detachment only retains recent operational data, not historical data. It was noted that the EOD Detachment usually deals with singular finds of ordnance creating a hazard, not the mass disposal of significant quantities. Referred to United States Naval Historical Center.

4.

Command:	United States Naval Historical Center, Washington Navy Yard, Washington, DC.
Title:	Director, Naval Historical Center, Acting
Name of Person Contacted:	Mr. William D. Vance
Contact Method:	Telephone inquiries on May 2 and 17, 1995 and one letter.
Questioned Concerning:	Availability of historical ordnance records, particularly concerning 1940 - 1975. Requested Command History and daily logs relating to the F/V *Irene Kay* recovering ordnance while conducting the Environmental Surveys of Deep Ocean Dredged Spoil Disposal Sites in Hawaii.
Results:	Received Command History report containing general information of the EOD Detachment and summary data for November 1976, but the Command History had no specific mention of the survey incident.

5.

Command:	National Archives, Pacific Region, San Bruno, CA.
Title:	Archivist
Name of Person Contacted:	Mr. Bill Green.
Contact Method:	Phone inquiries and letter.
Questioned Concerning:	Availability of historical ordnance records, particularly concerning 1940 - 1975.
Results:	Received some general information of minimal usefulness.
Command:	United States Naval Magazine, Lualualai, HI
Title:	Executive Officer
Name of Person Contacted:	LCDR Lucas, USN.
Contact Method:	Multiple telephone inquiries with follow-up calls.
Questioned Concerning:	Availability of historical ordnance records, particularly concerning 1940 - 1975. Request that some "old-timers" still on the staff be consulted. Availability of data concerning the "weekly barge" discussed by Commodore Nailer.
Results:	No historical data of that period is maintained at the naval magazine. Discussions with older staff were inconclusive.

6.

Command:	United States Army Pacific Command
Title:	Director, Explosive Ordnance Disposal (formerly Central Ammunition Management Office, Pacific (CAMOPAC))
Name of Person Contacted:	Major Kiefer, USA.
Contact Method:	Telephone inquiry with follow-up call.
Questioned Concerning:	Availability of U.S. Army EOD ordnance records, particularly with emphasis on WW II.
Results:	No records available. Referral to U.S. Army Pacific Command Historian and U.S. Army Historical Center.

7.

Command:	United States Army Pacific Command
Title:	Chief Historian
Name of Person Contacted:	Dr. Laird.
Contact Method:	Telephone inquiry with follow-up call.
Questioned Concerning:	Availability of historical ordnance records, particularly concerning 1940 - 1975.
Results:	None. Referred to National Archives.

8.

Command:	United States Army Historical Center, Carlisle Barracks, PA.
Title:	Historian.
Name of Person Contacted:	Ms Louise Arnold-Friend.
Contact Method:	Phone conversations and fax.
Questioned Concerning:	Availability of historical ordnance records for the Island of Oahu near Pearl Harbor, particularly concerning 1940-1975.
Results:	No applicable records on file.

9.

Command:	United States Army Explosive Ordnance Technical Center, Indian Head, MD.
Title:	Records Keeper.
Name of Person Contacted:	Ms. Ann Cashin.
Contact Method:	Phone conversations.
Questioned Concerning:	Availability of historical records concerning Pearl Harbor ordnance, particularly during 1940-1975.
Results:	No records of interest on file.

OTHER INTERVIEWS

1.
Arizona Memorial, National Park Service

Title:	Park Historian, Submerged Cultural Resources.
Name of Person Contacted:	Daniel Martinez.
Contact Method:	Meeting.
Questioned Concerning:	Availability of historical records concerning Pearl Harbor ordnance, particularly during 1940-1975.
Results:	No records of interest on file.

2.
LT Michael K. Nahoopii, USNR
Kahoolawe Ordnance Specialist
Honolulu, HI

Interview Report:	Mr. Michael Nahoopi'i
Residence:	Mr. Nahoopi'i currently lives in Honolulu, Hawaii.
Dates of interview:	May 1, 1995.
Method of interview:	Personal.

Background Summary: Mr. Nahoopi'i recently resigned from active naval service as the Officer-in-Charge of the on-site Kahoolawe ordnance clean-up operations during 1993 and 1994.

LT Nahoopi'i was assigned to the U.S. Navy Civil Engineering Corps while working on Kahoolawe. During that time he met various contacts within the state's and military's EOD community. He recommended contacting the following individuals and organizations which possibly could provide more information:

Commander Naval Surface Forces Pacific, San Diego, CA - Possible EOD records.
(Records actually at National Archives, Pacific Region, San Bruno, CA.)

Commander Naval Air Forces Pacific, San Diego, CA - Possible EOD records.
(Records actually at National Archives, Pacific Region, San Bruno, CA.)

Arizona Memorial
(No substantive information. See "Other Interview" #1.)

Veteran's of Foreign Wars, Oahu Chapter, Honolulu, HI.
(Contacted, received no substantive information.)

Veteran's Administration, Honolulu, HI.
(Contacted, received no substantive information.)

LT Dave Donovan — Officer-in-Charge
U.S. Navy EOD Detachment, Pearl Harbor.

(See "Interview" #3.)

CAPT Tom Bernit — Commanding Officer
Naval Magazine Lualualai
(See "Interview" #1 with LCDR Rossi.)

We subsequently contacted all these individuals or their successors. LCDR Gary Rossi (Executive Officer at Naval Magazine Lualualai, as well as CINCPACFLT staff officer) recommended that we call a Commodore Nailer, whose useful interview (#3) appears below.

3.

Interview Report:	Commodore R. Nailer, USN (Retired)
Residence:	Commodore Nailer currently lives in Aiea, Oahu, Hawaii.
Dates of interview:	July 5, 1995.
Method of interview:	Telephone.

Background Summary: Commodore Nailer was the first one-star naval Explosive Ordnance Disposal commander assigned to the Pacific Command. He served in that role during 1967-69, and again in 1972.

One job of the naval EOD teams was to respond to ordnance sightings and destroy or defuse the ordnance discovered. The EOD teams were not involved in any large or small-scale ordnance dumping operations. As regards the study area in the deep ocean outside of Pearl Harbor, he recalls no incidents where his teams responded.

Commodore Nailer also recalls a routine practice where a barge would be filled with ordnance (bombs and shells) at Naval Magazine Lualualai and taken periodically out to sea for disposal over the side. This occurred during his assignment in 1967-69. He does not recall whether the practice continued during his second assignment in the 1970's. He presumes this "weekly barge" dumped its cargo in deep water off the leeward coast of Oahu.

4.

Mr. Byron Donaldson
Mr. Norm Garon
DEI, Donaldson Enterprises, Incorporated. Bomb Disposal Services
45-1055 Kamehameha Highway, Suite 202
Kaneohe, HI 96744.

Interview Report:	Mr. Byron Donaldson
Residence:	Mr. Donaldson currently lives in Kaneohe, Hawaii.
Dates of interview:	Various during the period October 1994 - July 1995.
Method of interview:	Personal and telephone.

Background Summary: Mr. Donaldson is a retired U.S. Marine ordnance expert who established Donaldson Enterprises Incorporated, a local ordnance disposal company. DEI was contracted to identify specific items recorded during UH Environmental Center surveys.

Mr. Donaldson recalls hearsay information about large amounts of ordnance and equipment being disposed of at sea, off Oahu, immediately following World War II. This disposal was termed "Operation Roundup" and occurred during the six months after the war ended. He explained that since WW II draftee's terms would expire six-months after V-J day on 2 September 1945, and the war ended more suddenly than expected, a very rapid clean-up operation occurred. Common practice at the time was to dispose of excess ammunition by dumping it at sea.

****No mention was found of "Operation Roundup" in the Honolulu newspaper files.

APPENDIX A

SIDE SCAN SONAR MOSAICS

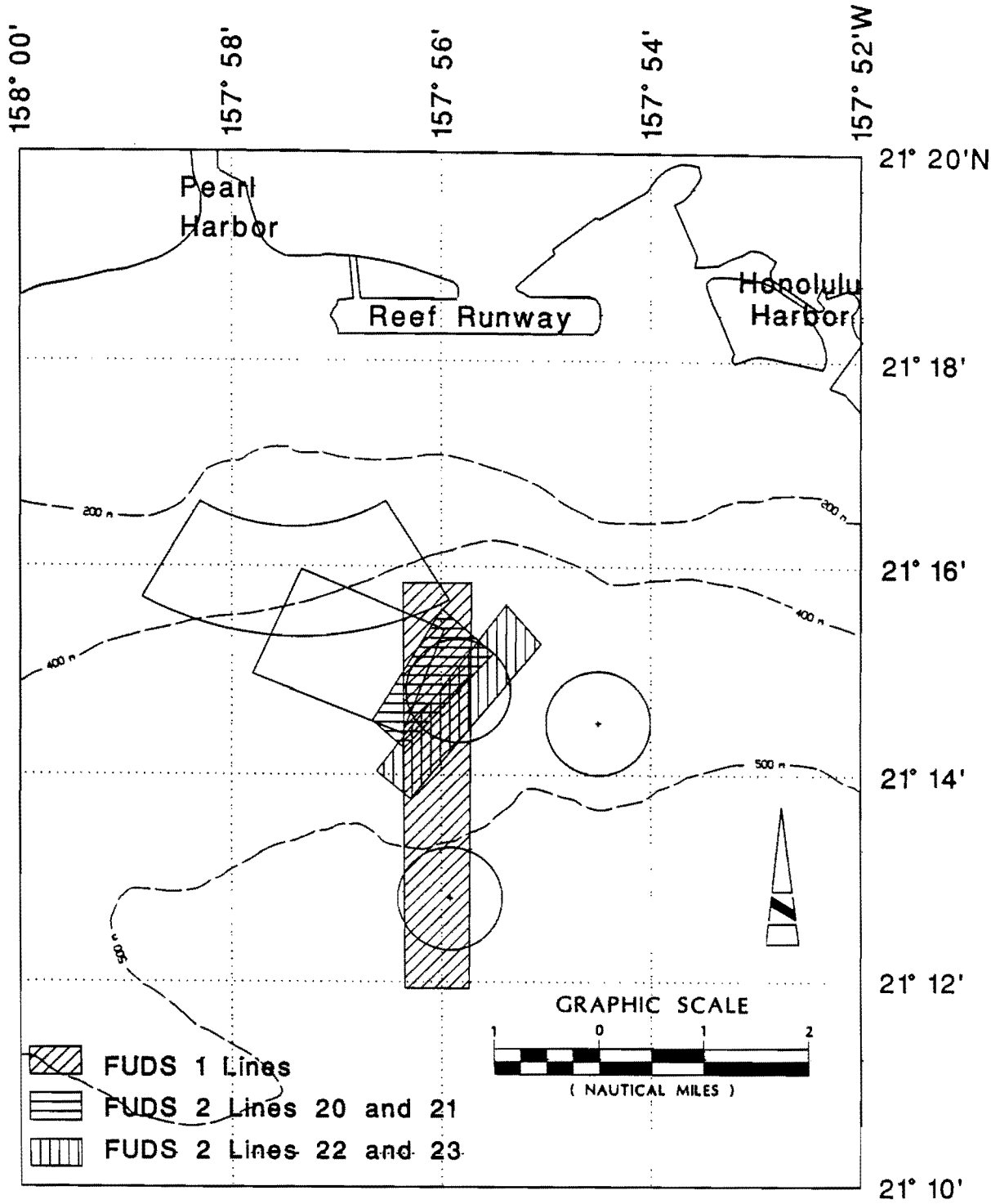
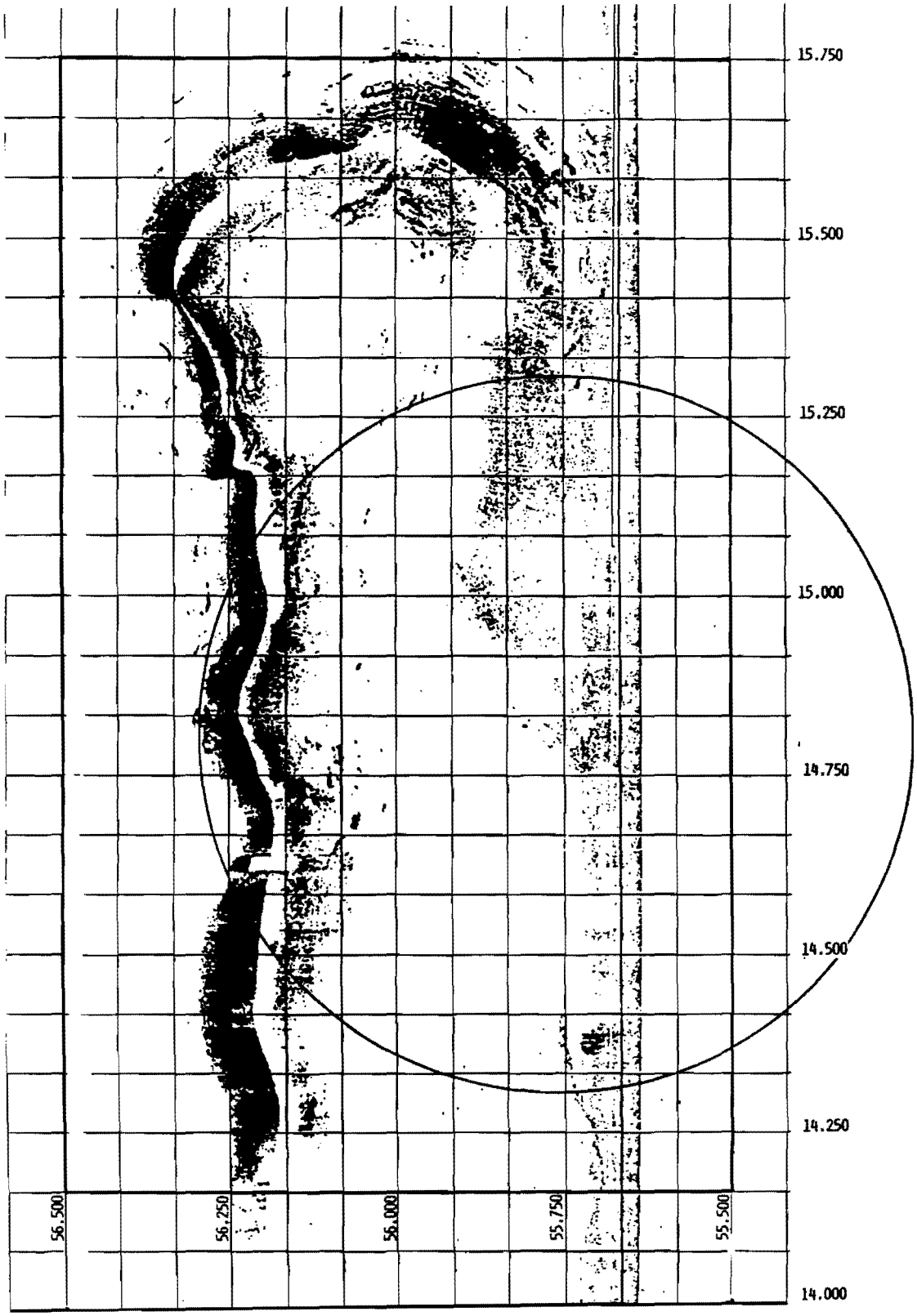


Figure 8. Areas covered by all side scan sonar mosaics taken in the vicinity of the FUDS Study Site 3 (H09HI0466) and FUDS Study Site 3A (H09HI0467).



SITE 3

FORMERLY USED DEFENSE SITE
NO. H09HI0466

R/V KILA NOVEMBER 16, 1994

EG&G DF - 1000 SIDE SCAN S

GEODAS PROCESSING

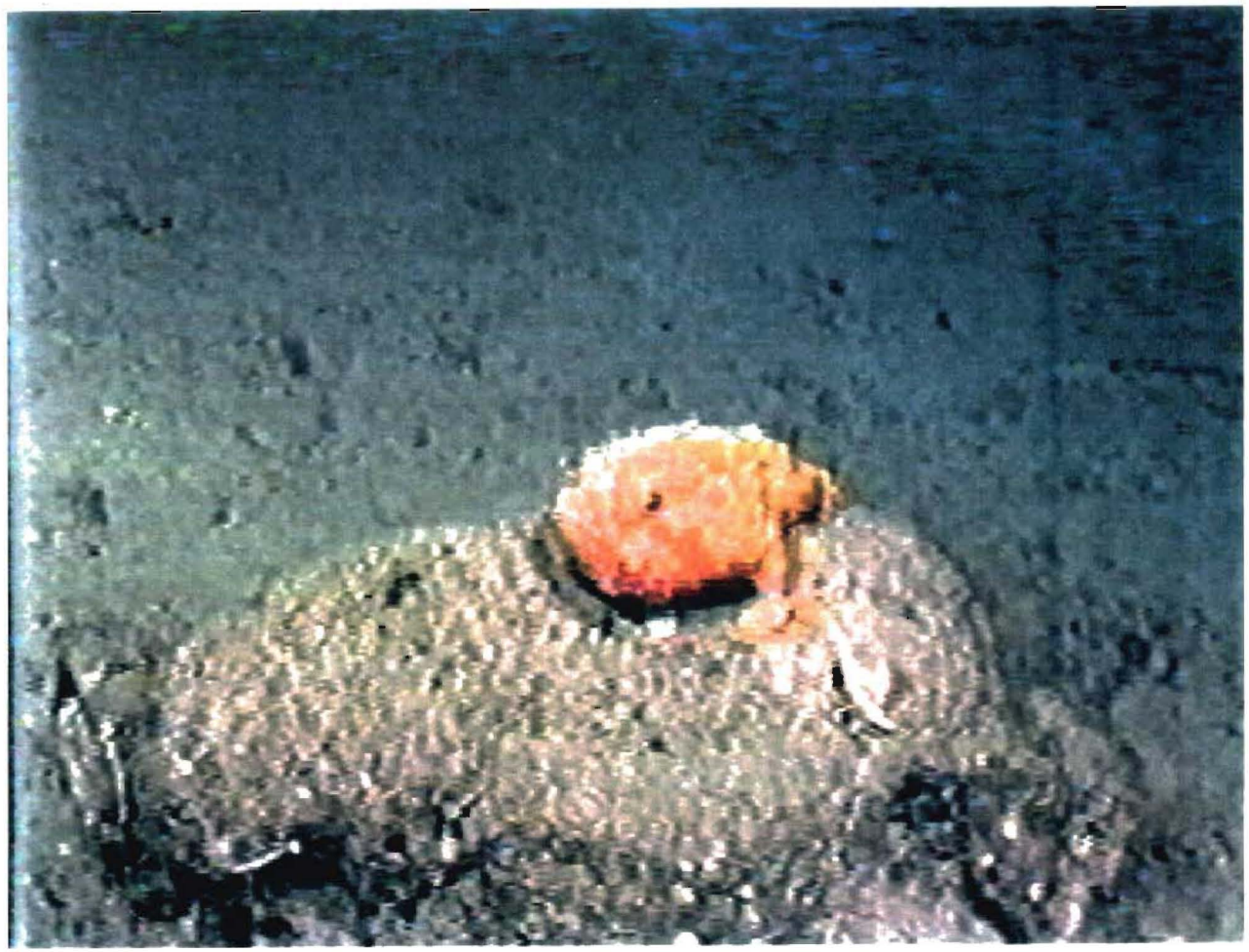
SHOWN WITHOUT LAYBACK

APPENDIX B

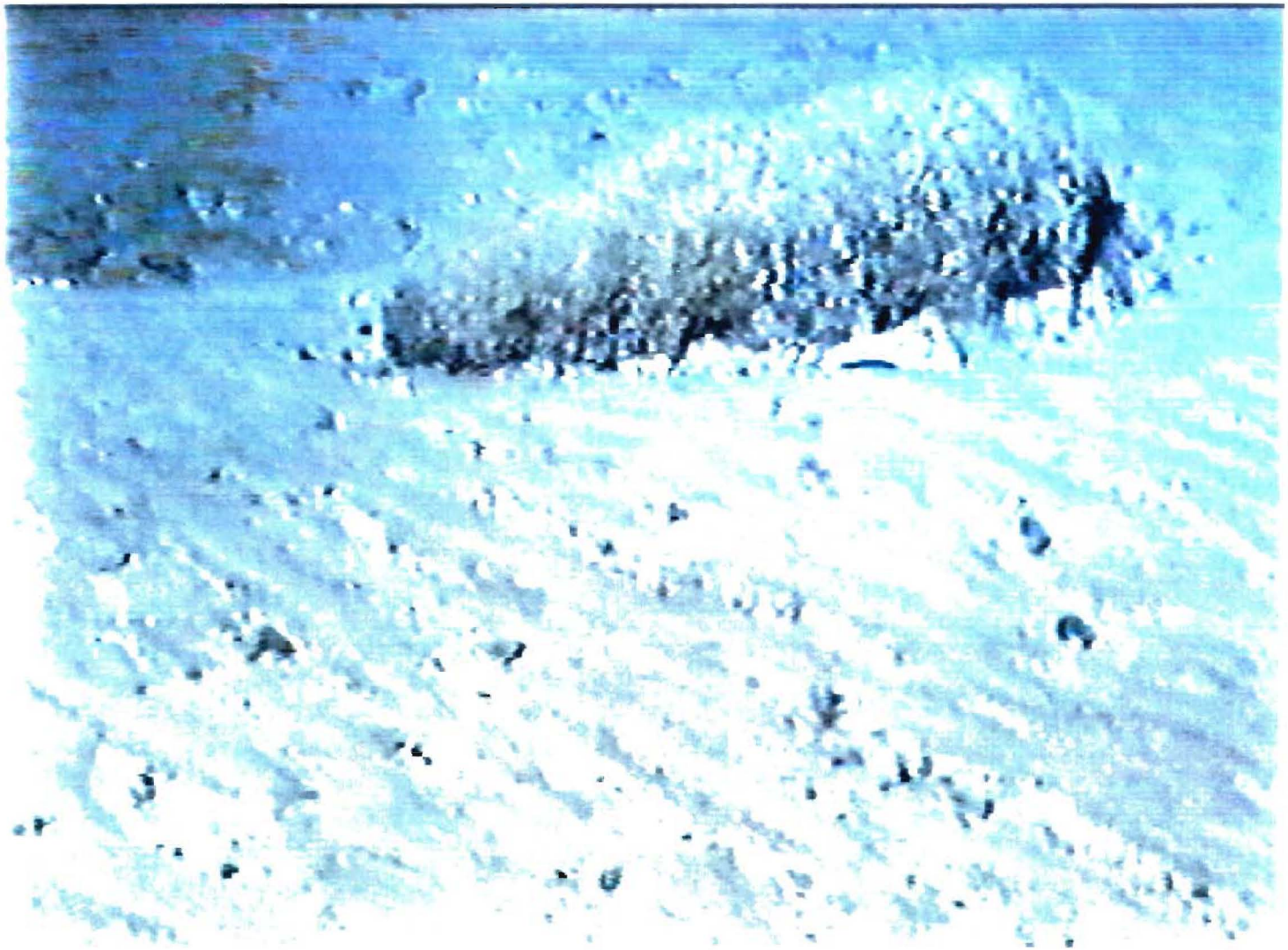
VIDEO IMAGES OF ORDNANCE AND VOICE TRANSCRIPTS

FUDS/FOCUS Video/Ordnance Locations				
Site 3				
Item No.	Description	Longitude	Latitude	Survey
		(157 deg)	(21 deg)	
1	Depth Charge, Torpex.	58	16	P5-200
2	Naval Projectile, 8" to 16".	58	16	P5-200
3	Projectile, Possible 40mm.	58	16	P5-200
4	Depth Charge, Amatol Filler.	58	16	P5-200
5	Projectile, 8" to 16", Explosive "D" Filler.	58	16	P5-200
6	Naval Artillery Shell 8" to 16", Explosive "D" Filler.	58	16	P5-200
7	Naval Artillery Shell 3" to 16", Explosive "D" Filler.	54.7	16.4	82-87
8	Naval Artillery Shell, Explosive "D" Filler.	54.7	16.4	82-87
9	Naval Artillery Shell, Explosive "D" Filler.	54.7	16.4	82-87
10	MK 50 Mech Time Fuse, Black Powder Filler.	54.7	16.4	82-87
11	Depth Charge, Torpex.	54.7	16.4	82-87
12	Mine.	54.7	16.4	82-87
13	Projectile, 8" to 16".	54.7	16.4	82-87
14	Naval Artillery Shell 8" to 16", Explosive "D" Filler.	54.7	16.4	82-87
15	MK 50 Mech Time Fuse, Black Powder Filler.	54.7	16.4	82-87
16	Projectile Shape w/Deposits of Residue in General Area.	56.34	15.51	8/24/95
17	Projectile.	56.02	15.43	8/24/95
18	Cylinder with Fin Configuration.	55.91	14.99	9/28/94
19	Flat Circular Plate or Base of Projectile.	55.43	15.37	8/24/95
20	Projectile.	55.14	16.05	8/24/95
21	Bomb (100-250 lb.). Configuration Suggests Chemical.	56.33	16.09	8/24/95
22	Small Arms Ammunition.	54.66	16.03	8/24/95
23	3" Cartridge Case and Round.	54.66	15.21	12/12/95
24	Projectile, Possibly 8".	54.64	15.25	12/12/95

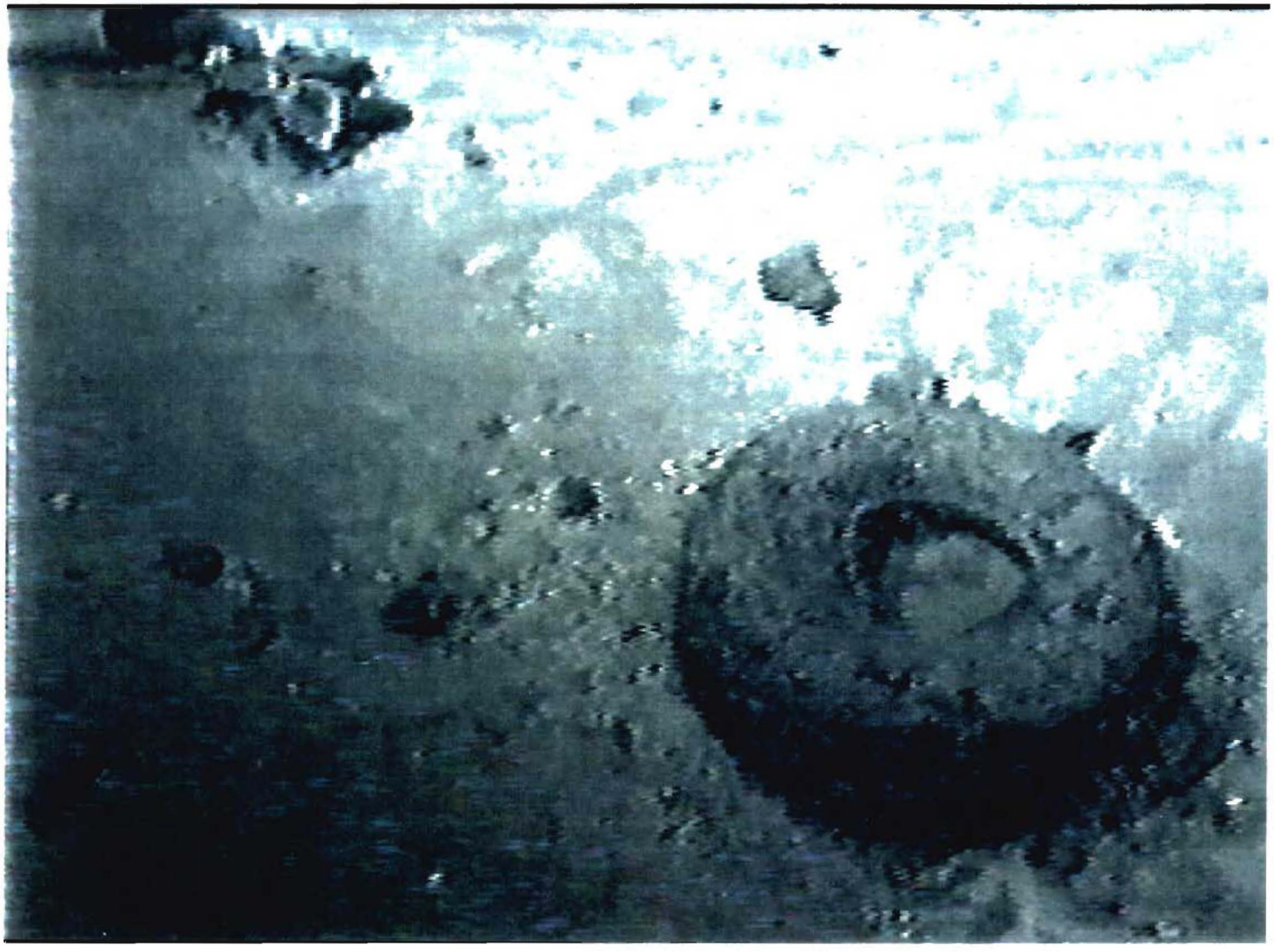
Table 1. Location and description of ordnance video taped during FOCUS transects and HURL surveys. Ordnance identified by Donaldson Enterprises.



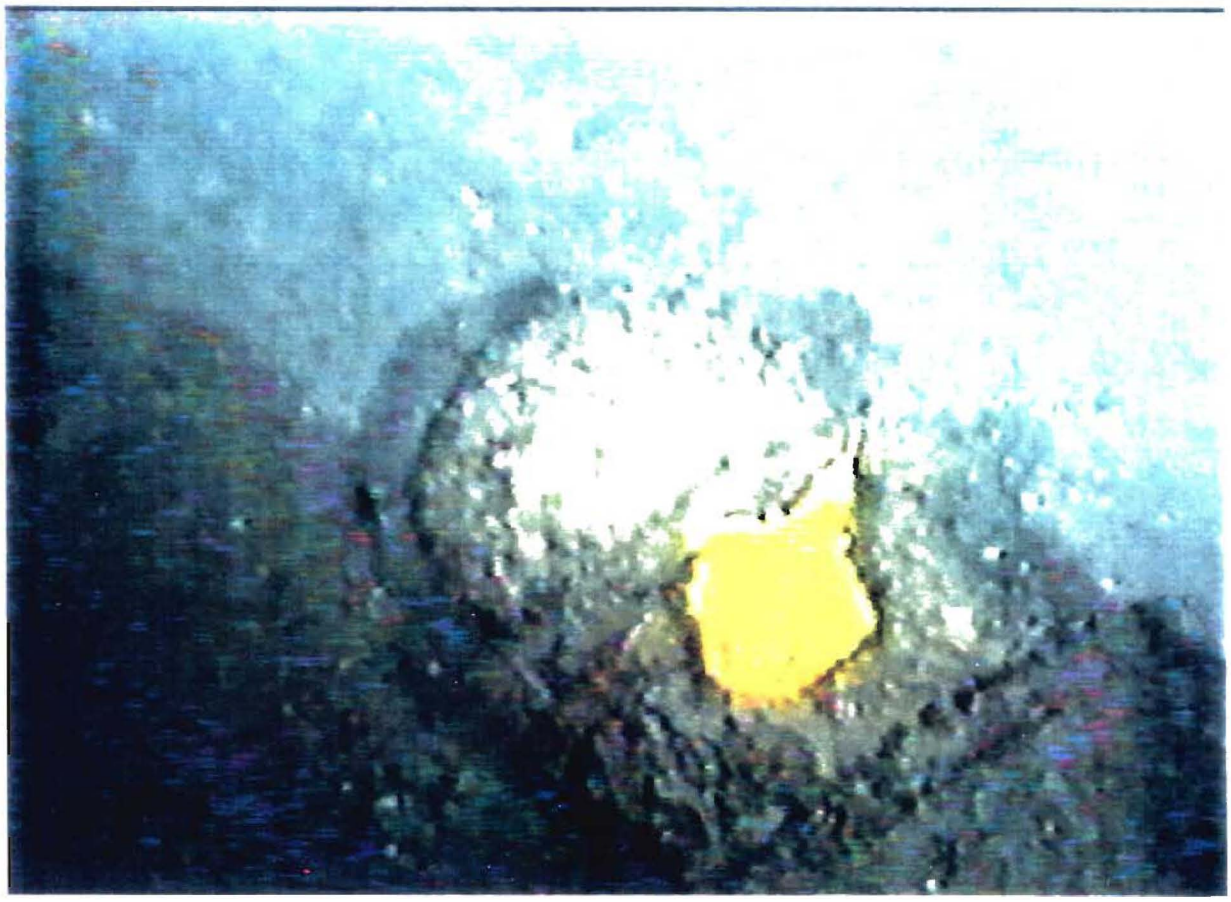
Item 1. Depth Charge, Torpex.



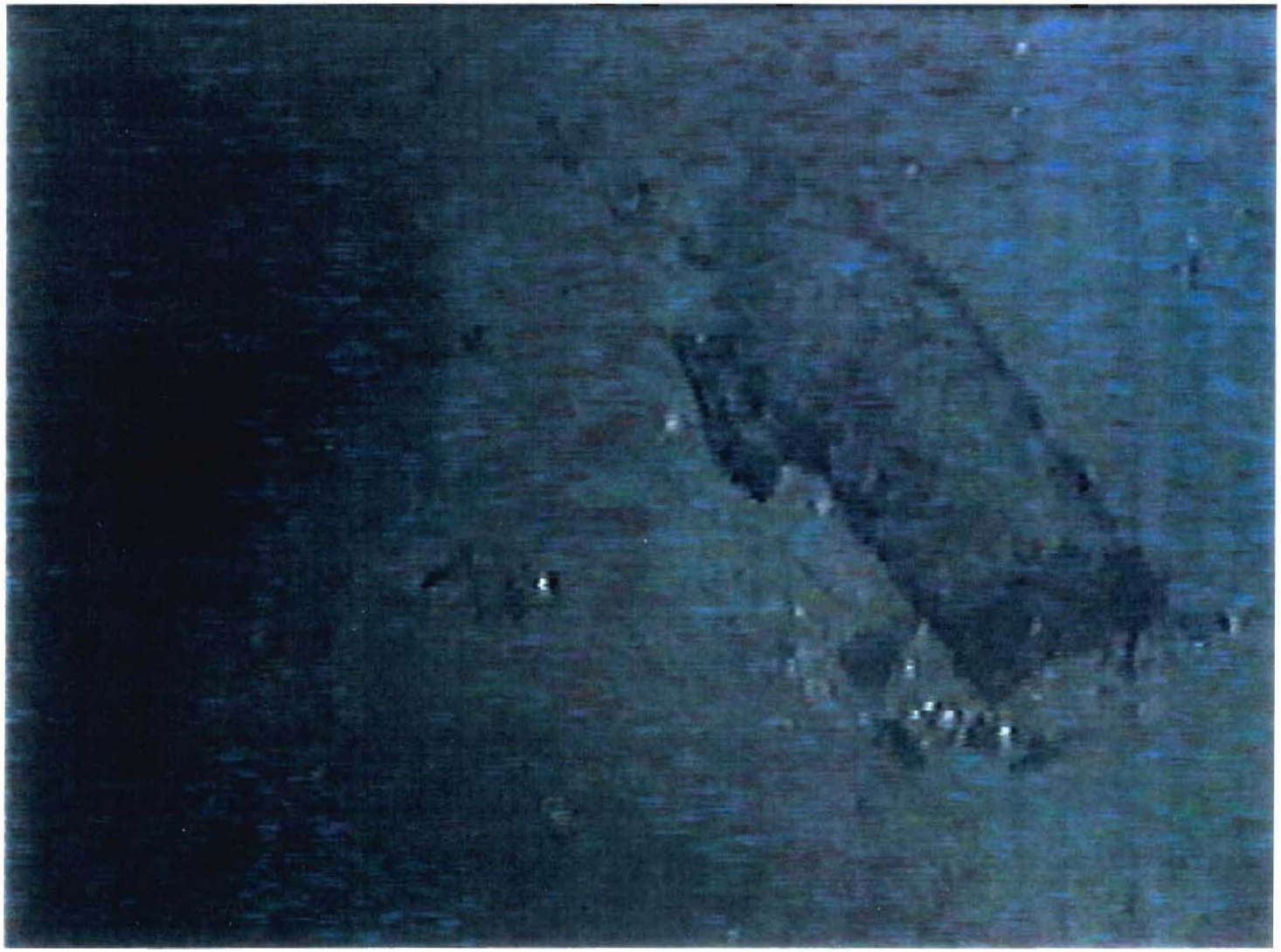
Item 2. Naval Projectile, 8" to 16".



Item 3. Projectile, Possible 40mm.

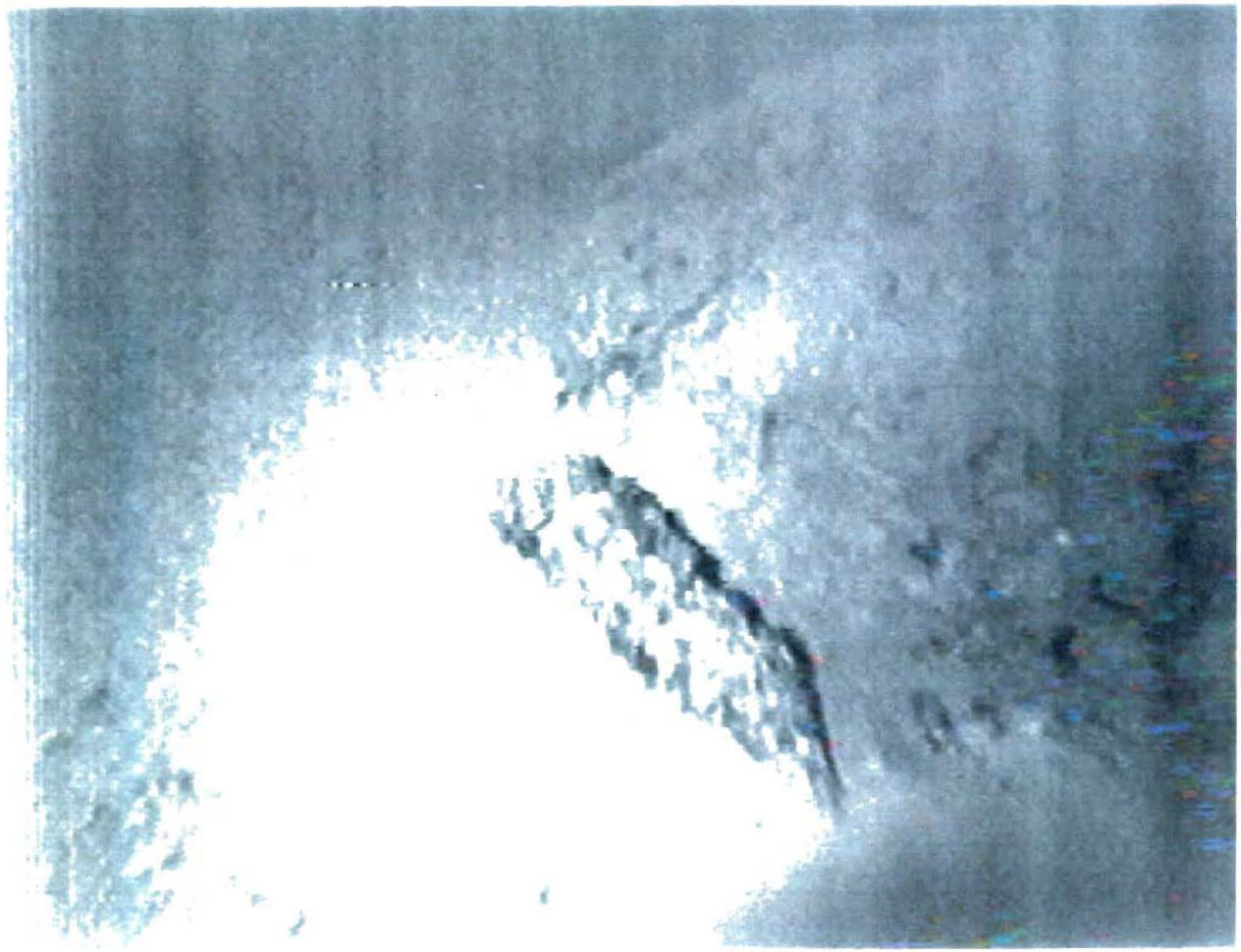


Item 4. Depth Charge, Amatol Filler.

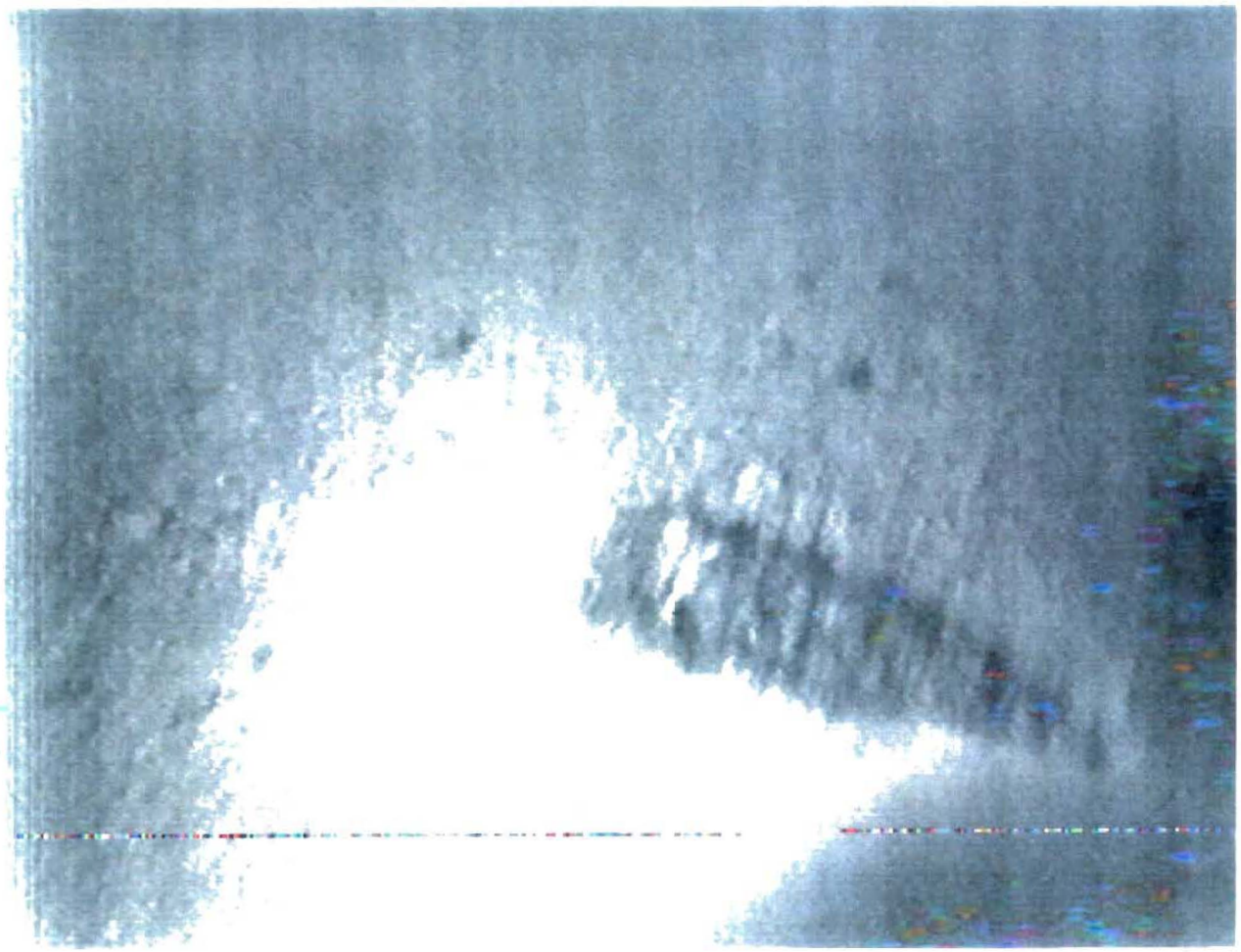


Item 5. Projectile, 8" to 16", Explosive "D" Filler.

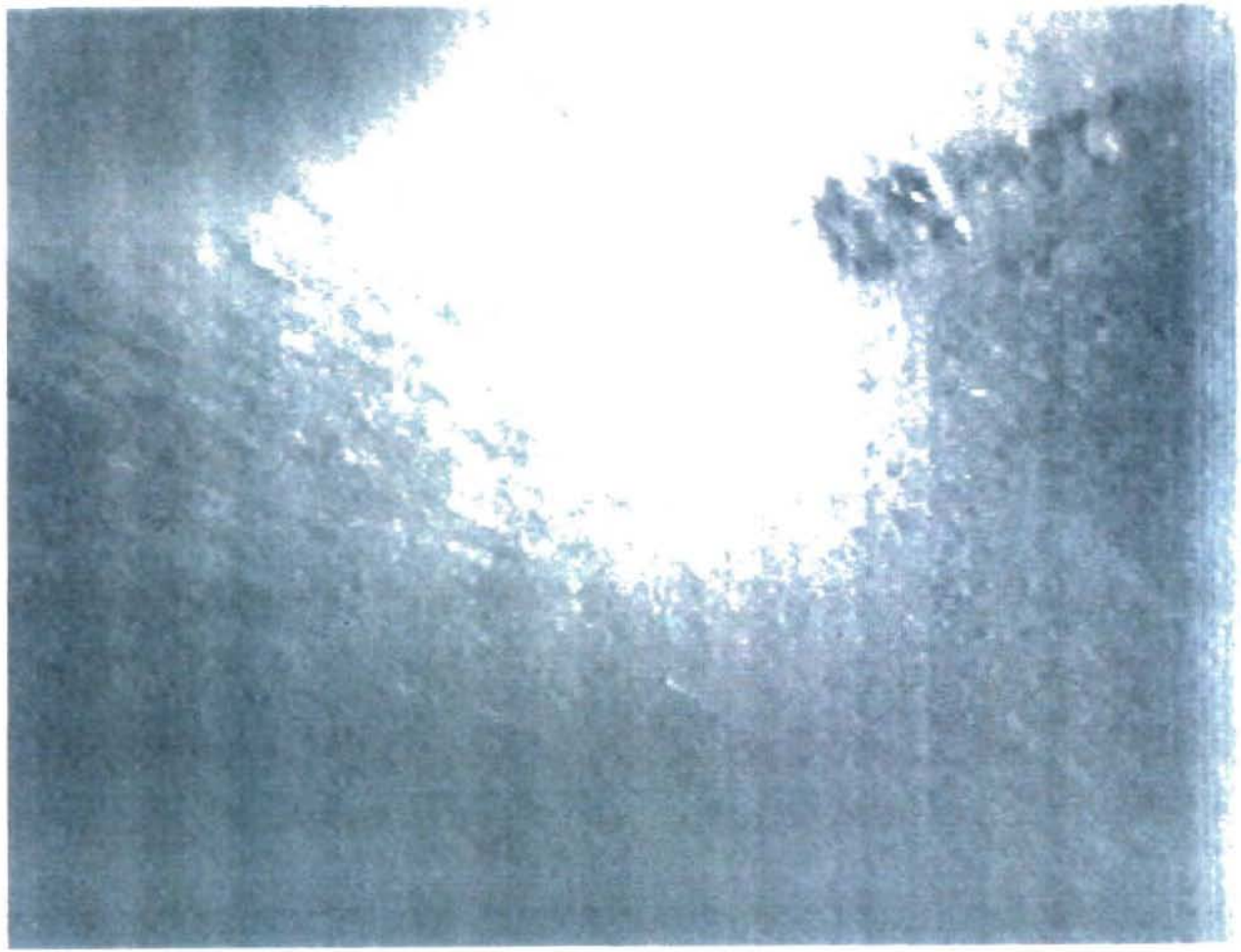
Item 6. Naval Artillery Shell 8" to 16", Explosive "D" Filler.



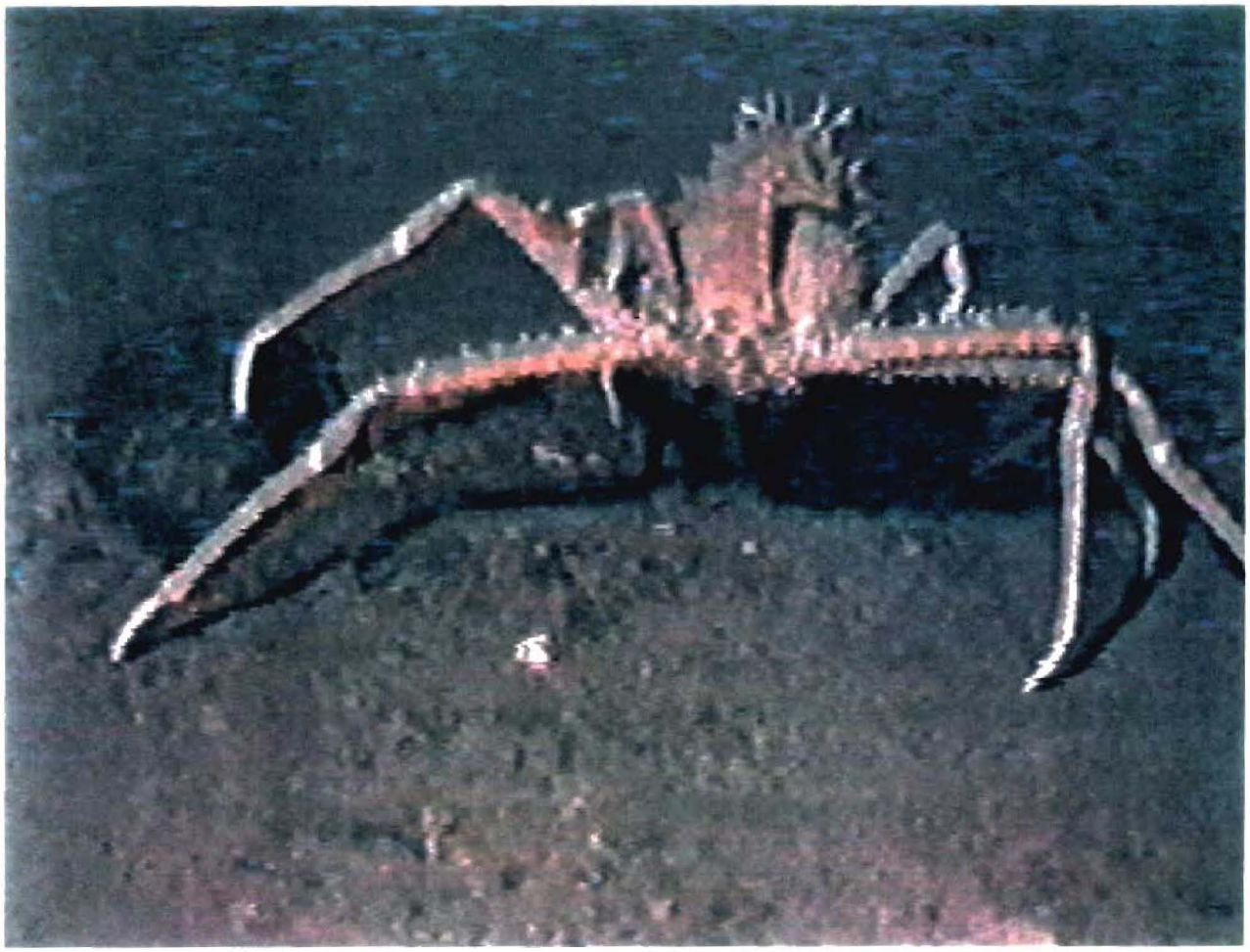
Item 7. Naval Artillery Shell 3" to 16", Explosive "D" Filler.



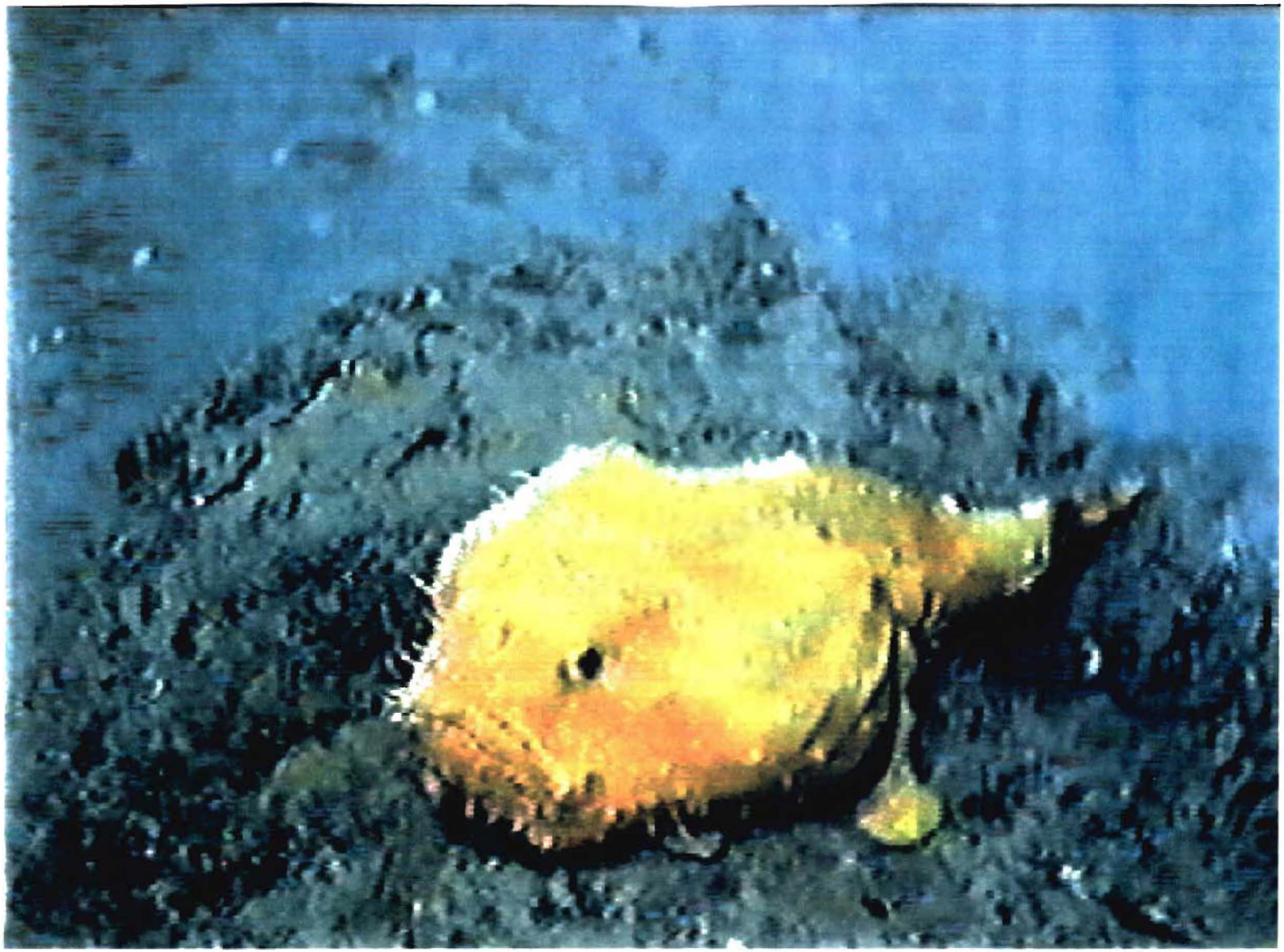
Item 8. Naval Artillery Shell, Explosive "D" Filler.



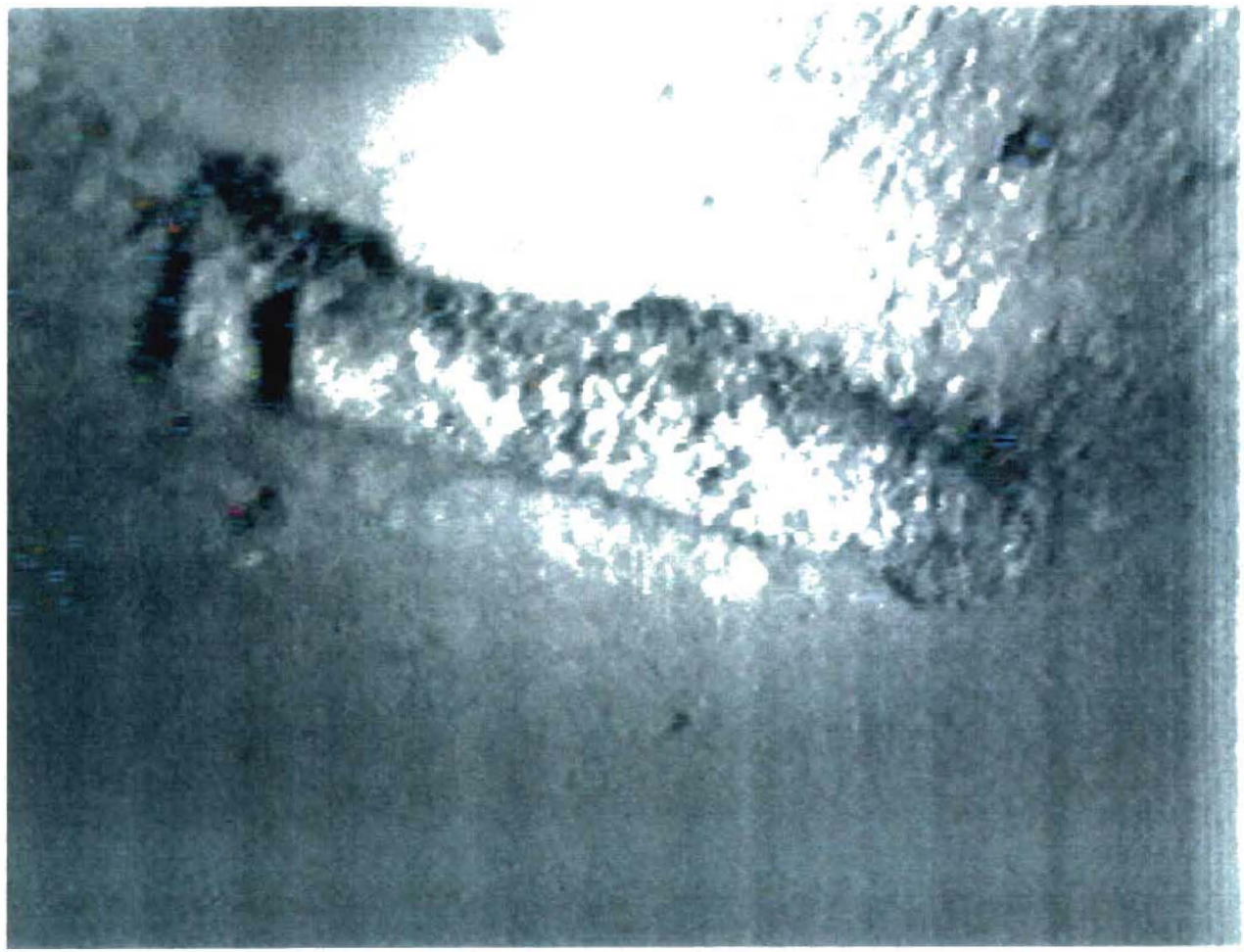
Item 9. Naval Artillery Shell, Explosive "D" Filler.



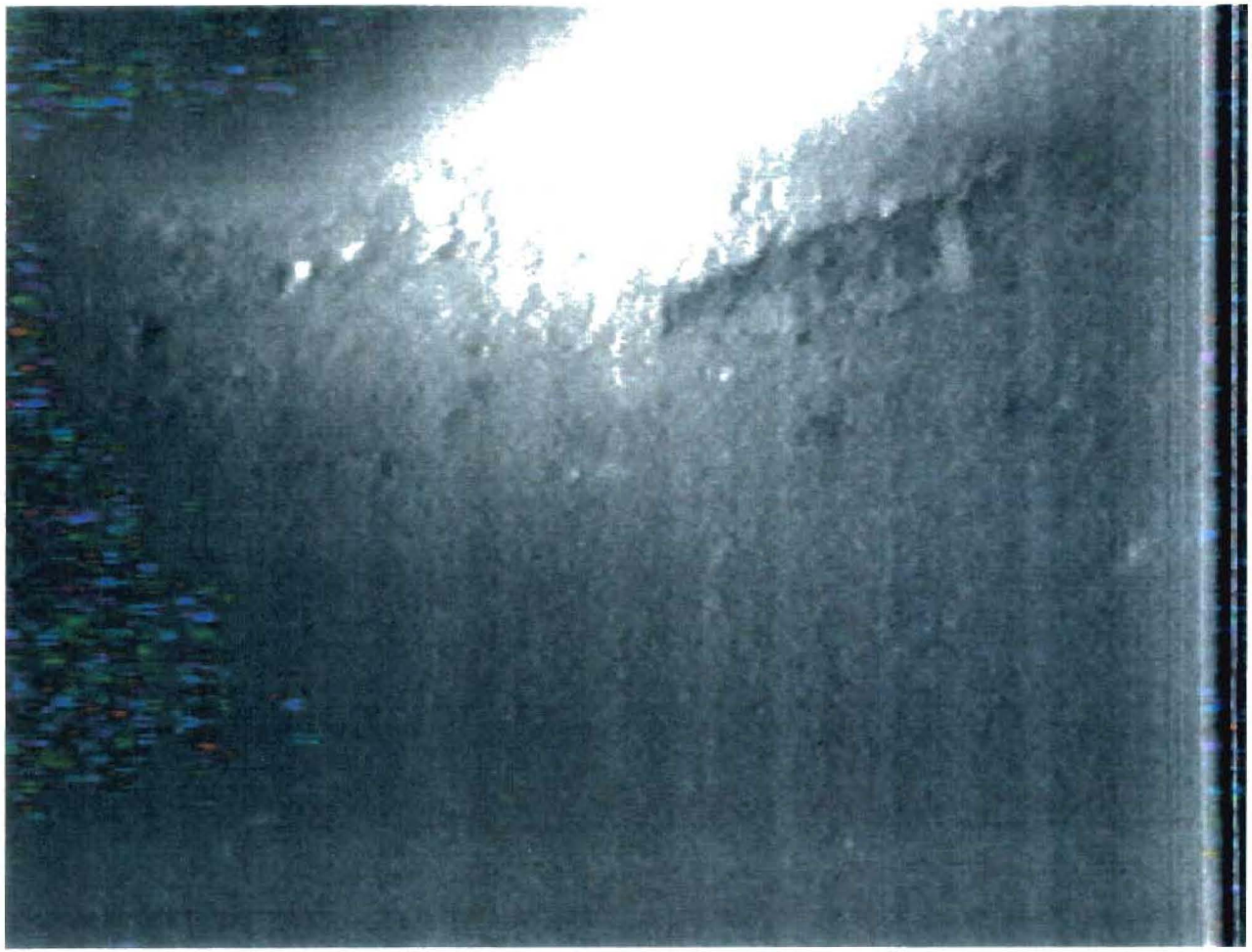
Item 10. MK 50 Mech Time Fuse, Black Powder Filler.



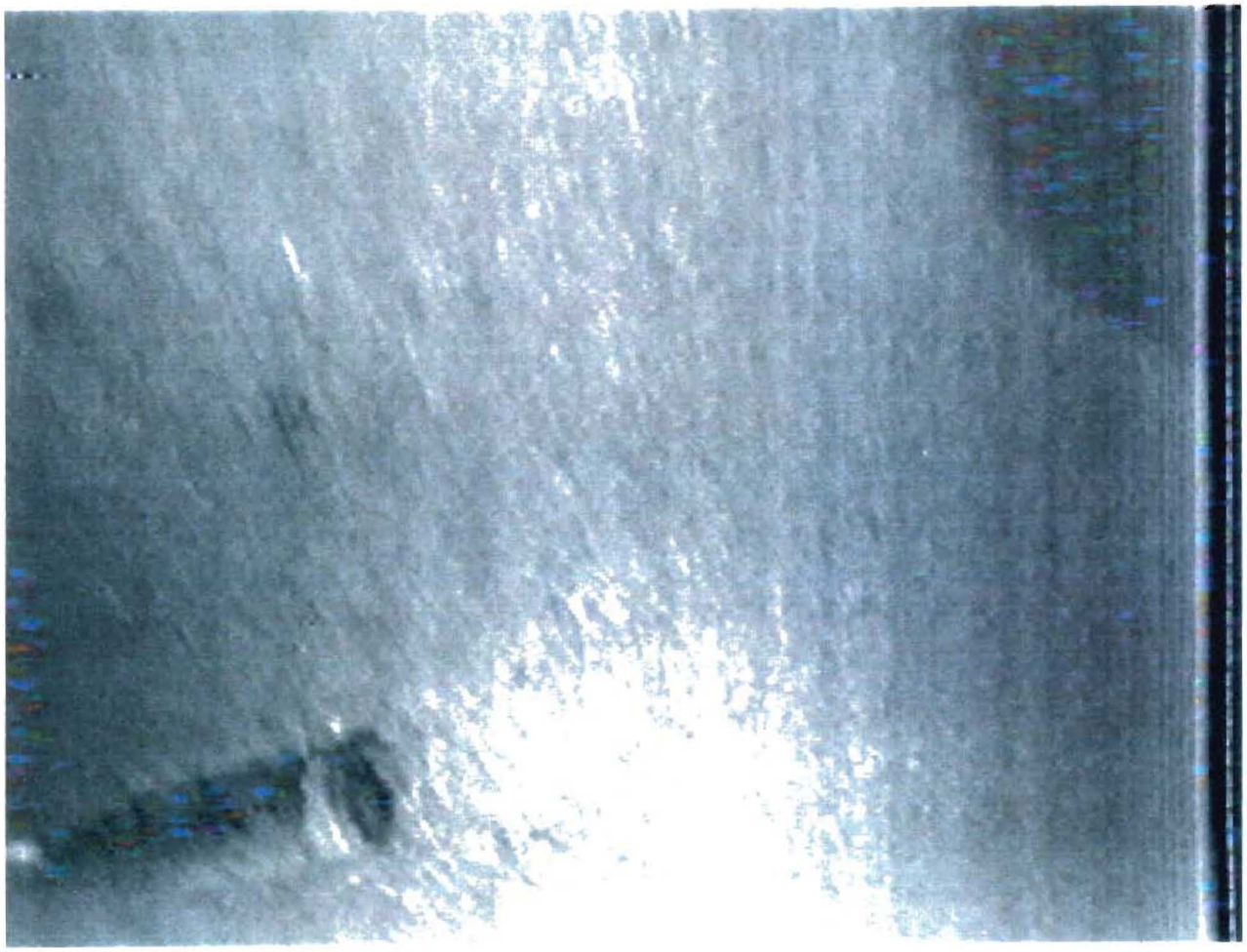
Item 11. Depth Charge, Torpex.



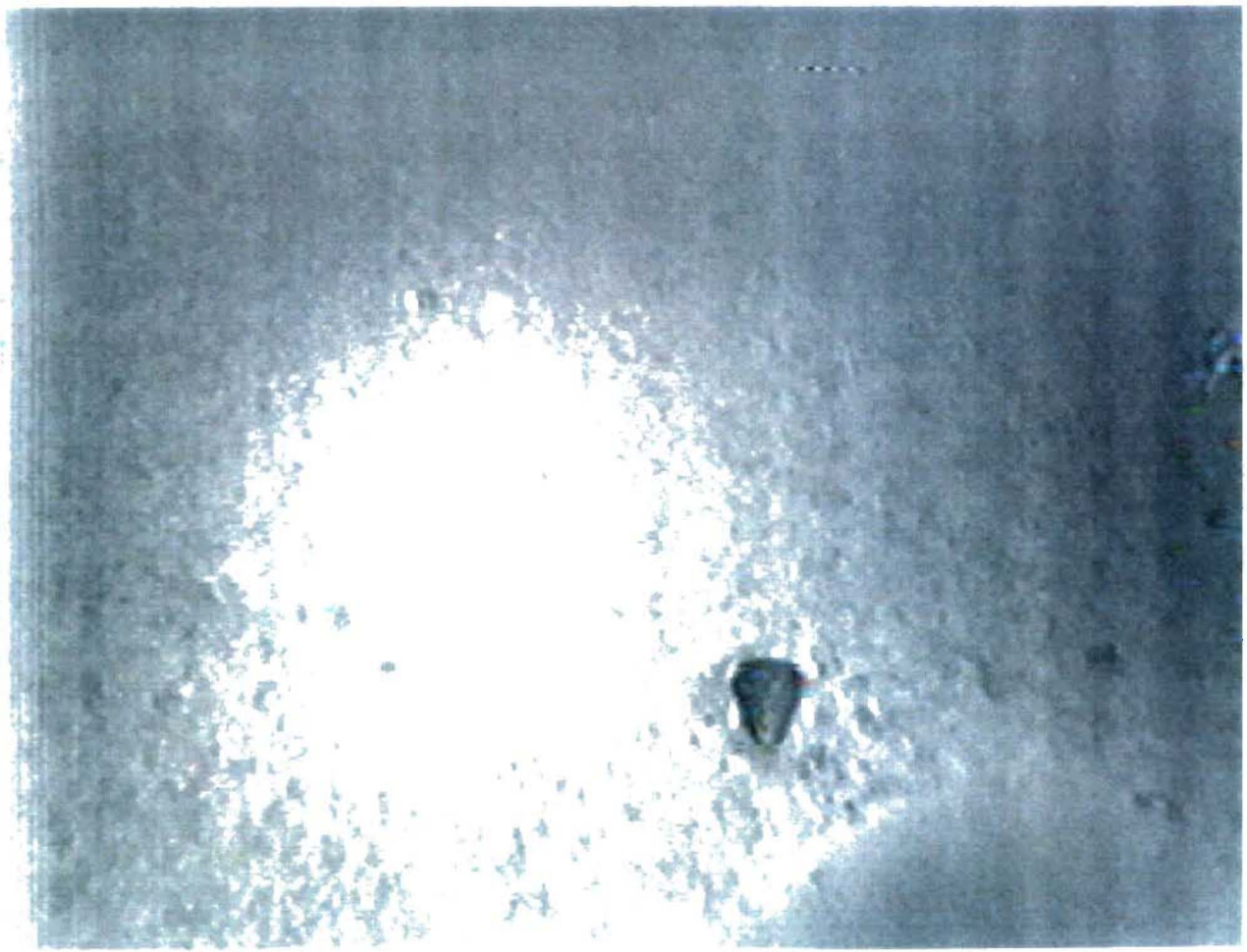
Item 12. Mine.



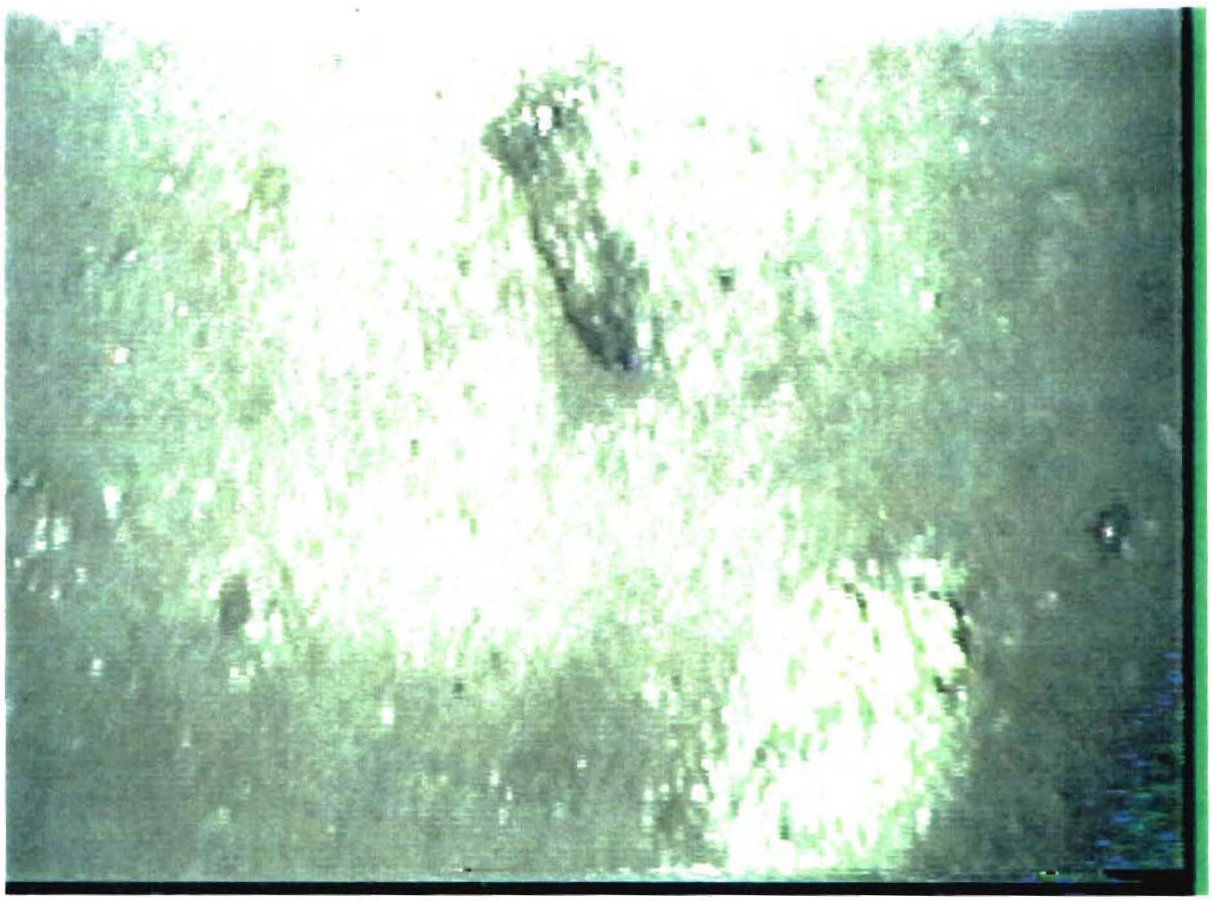
Item 13. Projectile, 8" to 16".



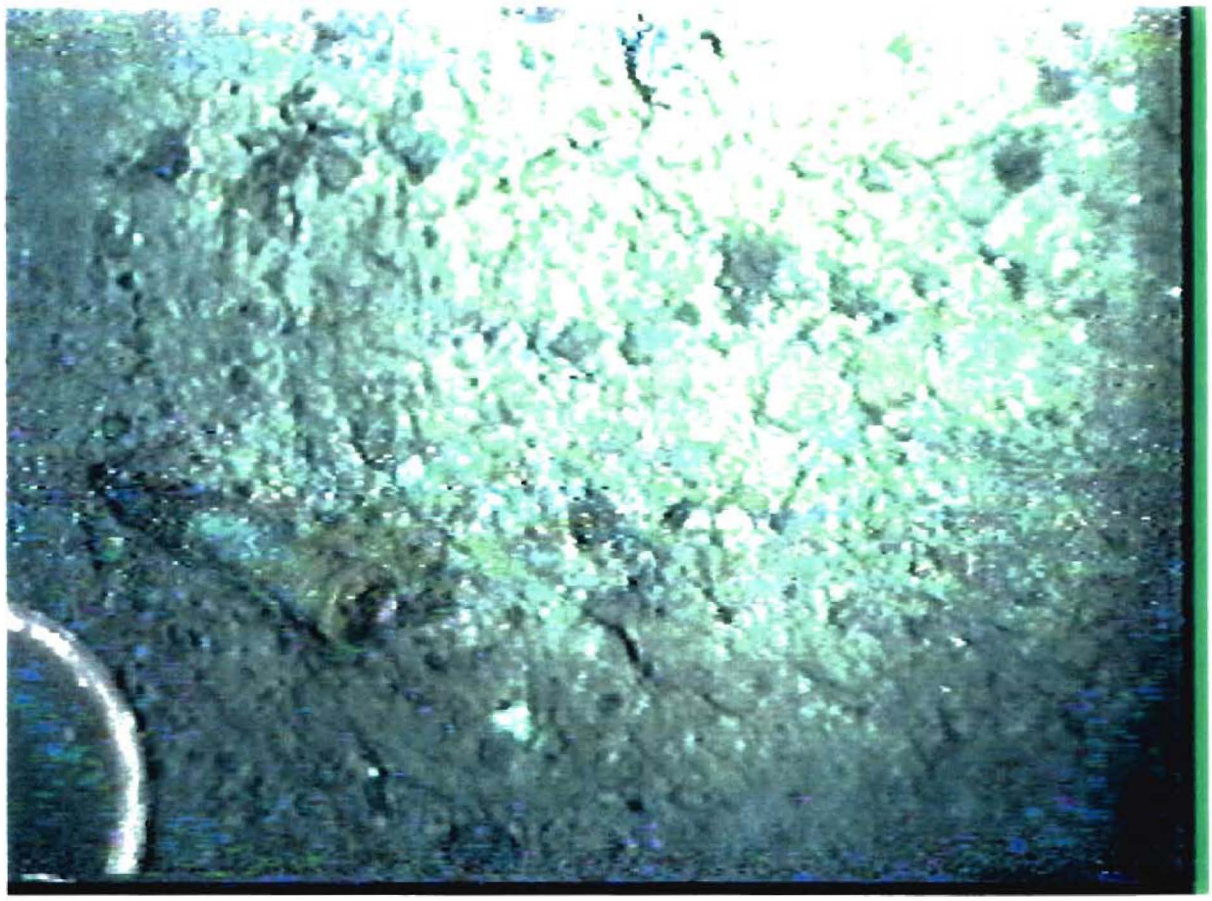
Item 14. Naval Artillery Shell 8" to 16", Explosive "D" Filler.



Item 15. MK 50 Mech Time Fuse, Black Powder Filler.

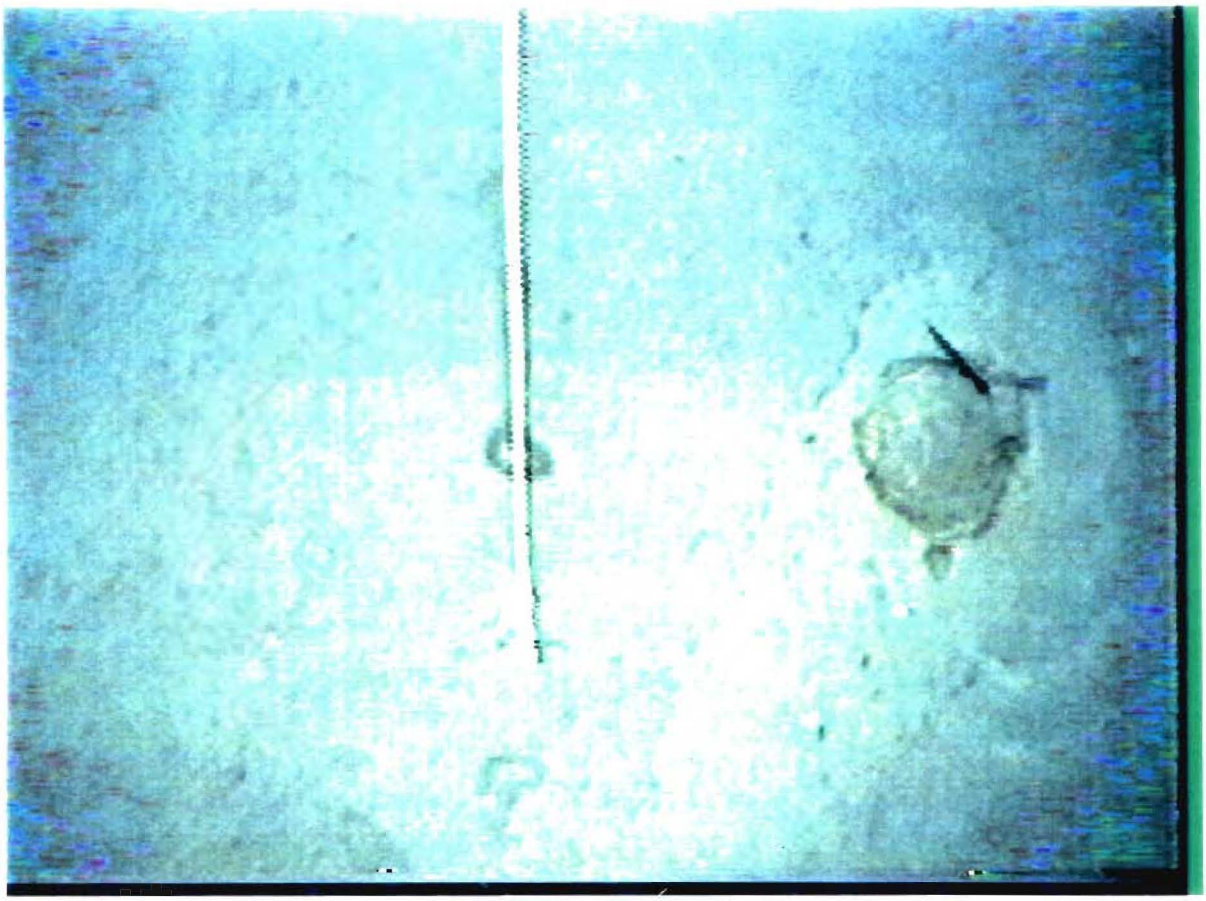


Item 16. Projectile Shape with Deposits of Residue in General Area.

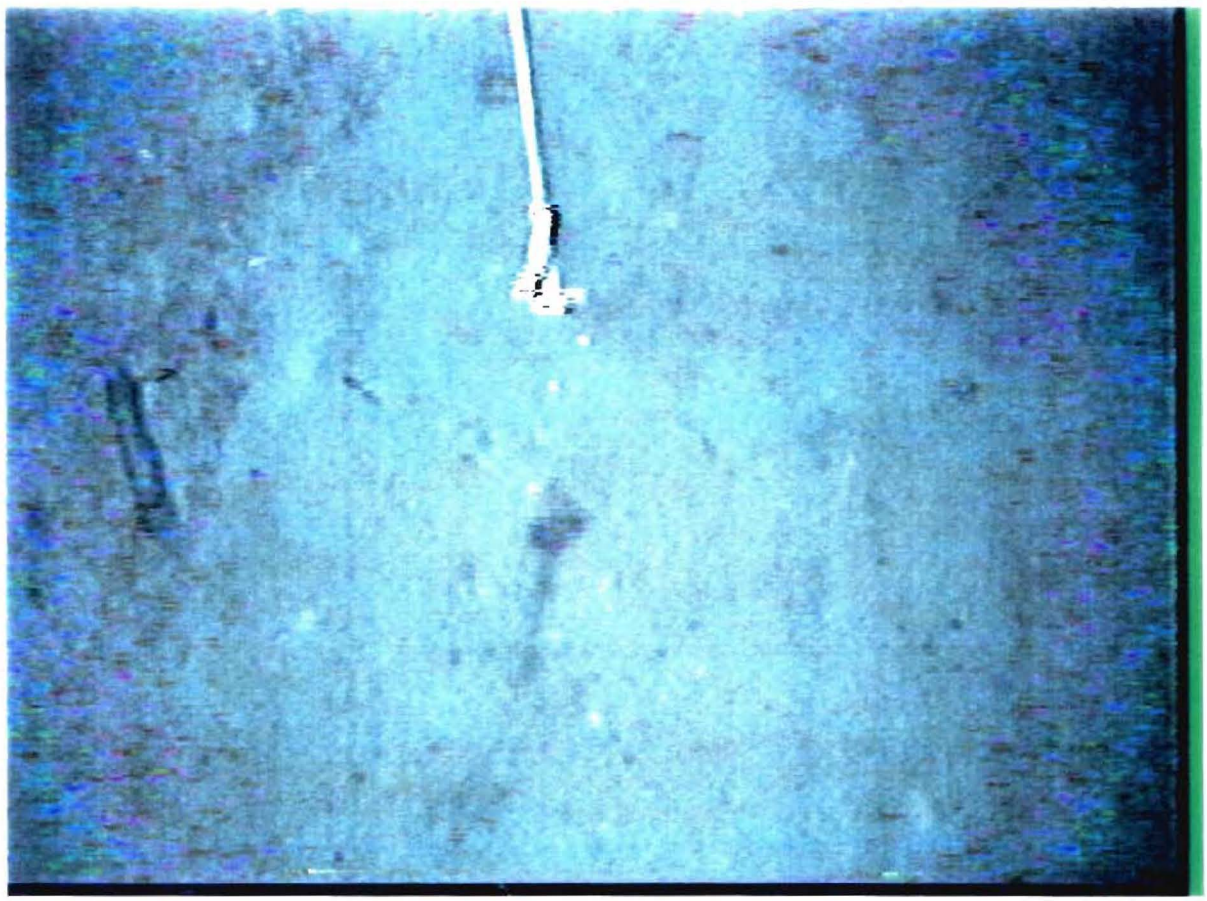


Item 17. Projectile.

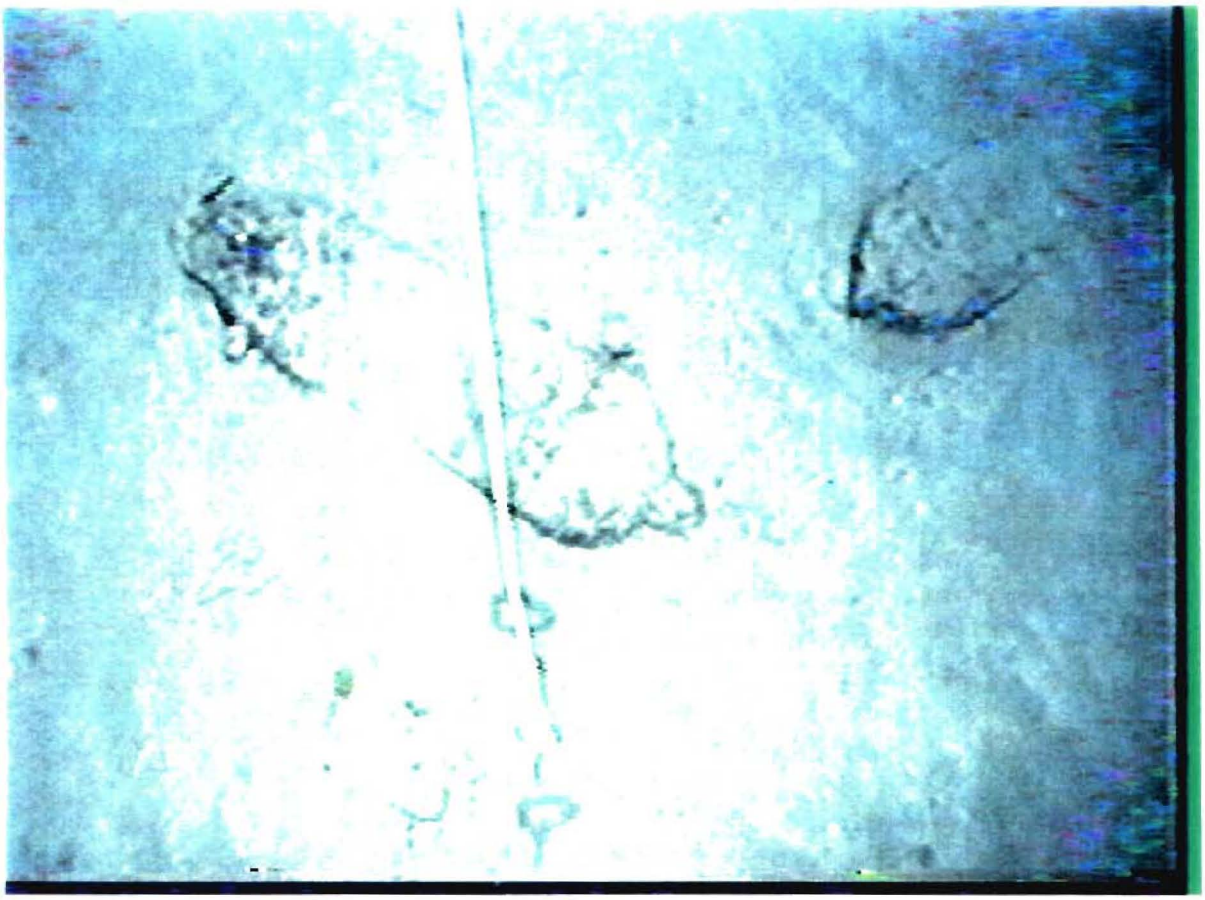
Item 18. Cylinder with Fin Configuration.



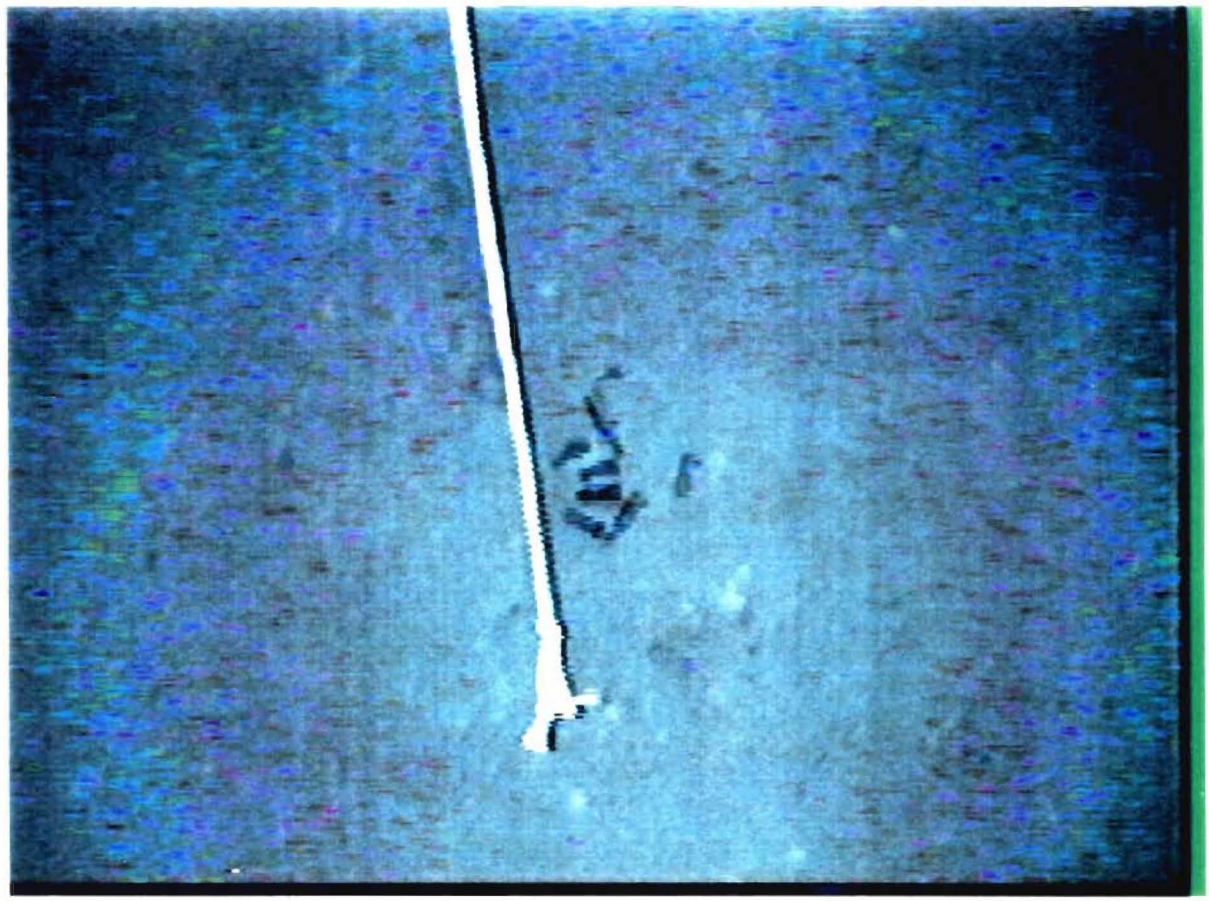
Item 19. Flat Circular Plate or Base of Projectile.



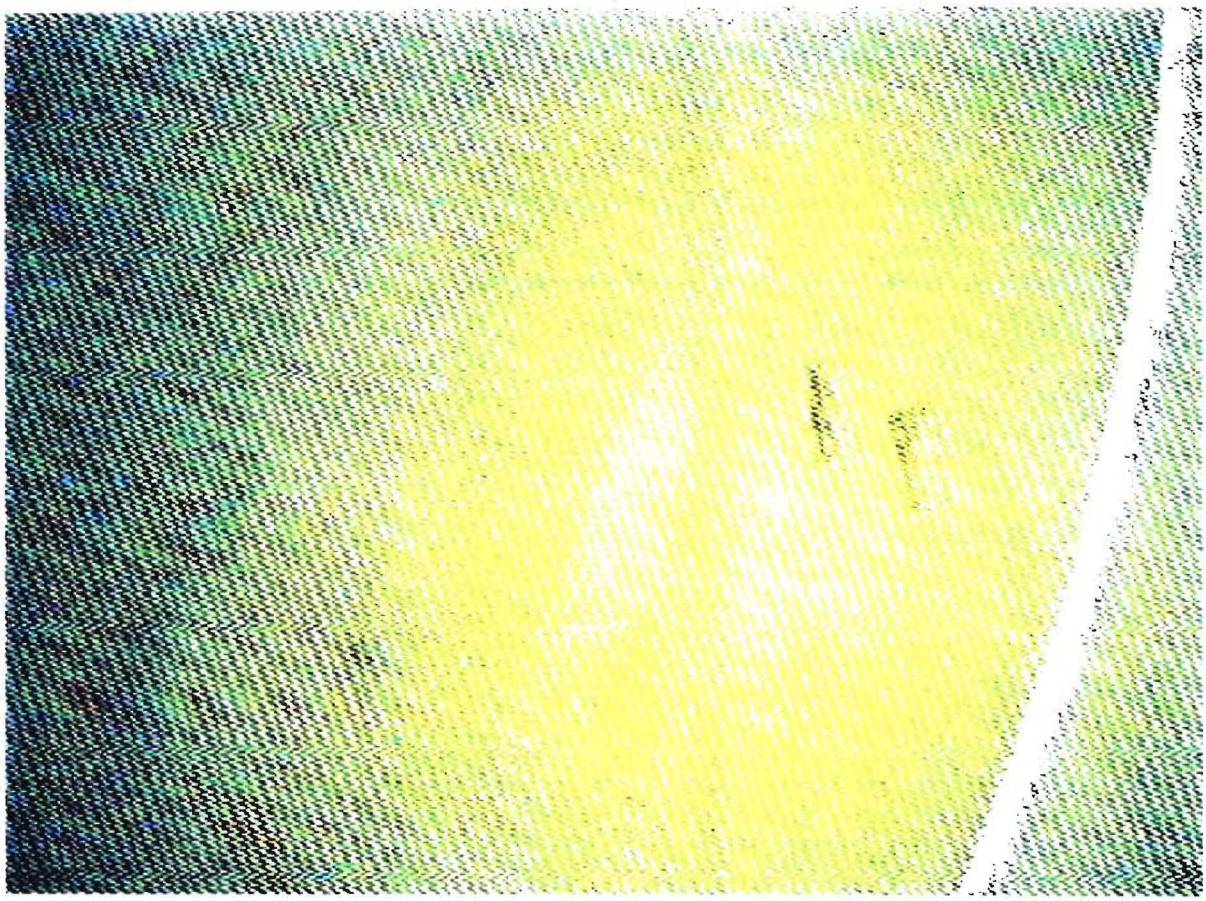
Item 20. Projectile.



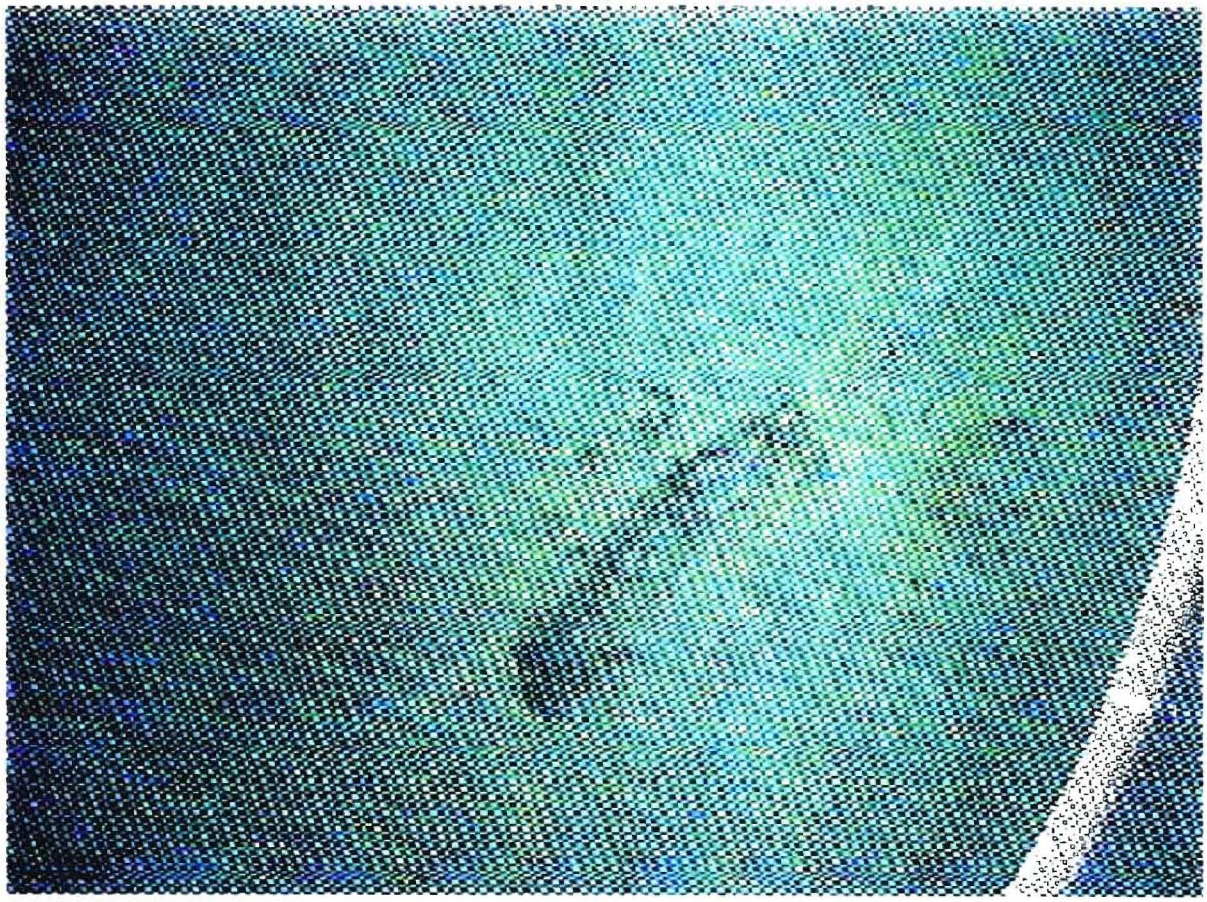
Item 21. Bomb (100-250 lb.).
Configuration Suggests Chemical.



Item 22. Small Arms Ammunition.



Item 23. 3" Cartridge Case and Round.



Item 24. Projectile, Possibly 8".

HURL Dive Voice Transcripts

P5-200. Pisces V. July 27, 1992 21° 16.0' N. Lat. 157° 58.0' W. Long.

Carter: We're right over it, a bomb.

Larkin: That looks like a shell out of a battleship, one of those big 16-inch, boy that'll make a big bang.

Carter: What's the depth charge?

Larkin: They rolled them right off of something because they're nicely spaced.

Kerby: Could be, because it looks like those two rings would lay in a track.

Larkin: And roll right off the back of the destroyer.

Kerby: But normally what they had was just a regular....

Carter: Early in the war it's hard to say what they had.

Carter: There's another one of them warheads.

Kerby: There's a shell....

Carter: There's a big shell....

Carter: There's a bomb with the shell next to it.

Larkin: Either we're right back on the bomb road or there are literally bombs every few feet down here.

(See Photos 36 and 40)

Larkin: There's a bullet, look at the size of that shell.

Carter: Something straight out, a shell looks like.

(See Photo 42)

Carter: Here's the shell right here.

Carter: There's a big 16 inch shell, it looks like it's used.

Carter: There's a bomb, depth charge.

(See Photos 33 and 38)

Carter: It's a bomb with a Chaunax on it.

Larkin: ...probably mustard dust bombs or something that they brought out here to get rid of.

Kerby: I'm really surprised too. I think the areas we dived up closer had a lot more junk, not so much airplanes as bombs.

Carter: That's a hedgehog, it launches like a rocket out of a launcher.

Carter: The same shell.

Larkin: Or is it a front of a torpedo?

Carter: Nah, 16 incher.

Larkin: That's a 16 inch shell, I know it's from a battleship. Big stuff.

Larkin: Under a 16 inch shell too.

82-87. Makali'i. May 3, 1982 21° 16.3' N. Lat. 157° 54.8' W. Long.

(See Photos 29, 30, 31, 32)

Bartko: Take a look at that. You can see down there. It's a nose cone from a projectile.

Dollar: ...That's pretty clear the way it's just sitting there. It's really interesting how these little old objects that have obviously been down here for a long time aren't covered at all....

Bartko: ...Some of those big heavy objects look like some of those mines.

(See Photo 30)

Bartko: Steel objects of some kind, projectiles, pointed on one end.

(See Photo 41)

Dollar: Whole pile of them...looks like torpedoes. Some of them 3 feet long, about four of them laying on top of one another.

Quick Look Report 82-82. Makali'i. April 23, 1982. 21° 16.7' N/157° 56.7' W.

"Also many debris items (such as depth charges) were sitting in depressions, suggesting that strong currents may be causing large or heavy rocks/obstacles to settle."

"A considerable amount of trash, debris, discarded munitions, and cable litter the bottom in all areas."

"Unexploded munitions are also scattered over much of the bottom."

"Most common debris: boxes, cables, coffee cups, plastic sheets, pipe, munitions, machinery, wire, battle helmets...."